MYRMECIA

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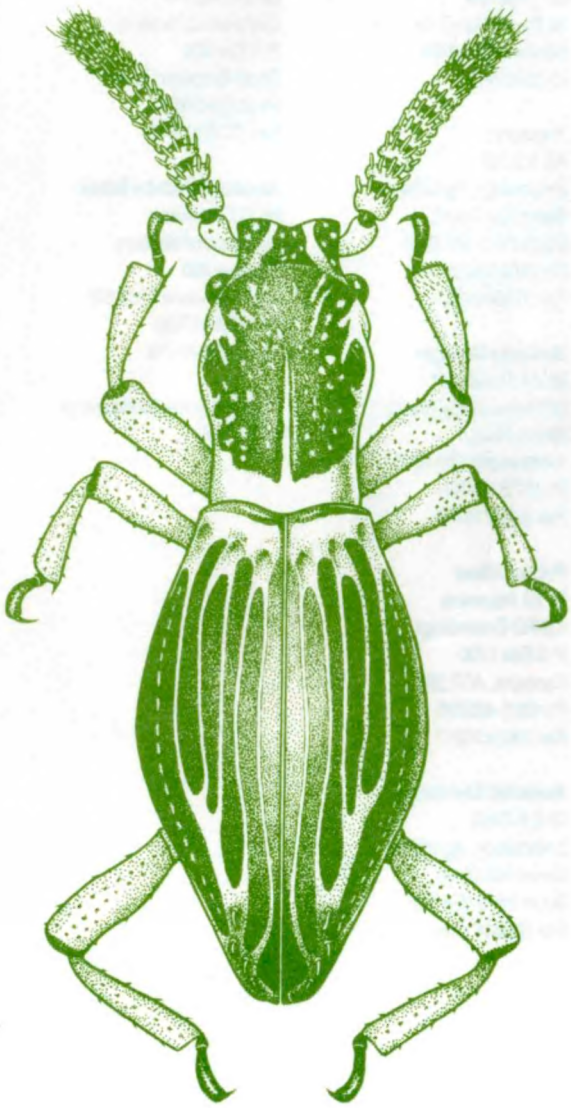

AUSTRALIAN ENTOMOLOGICAL SOCIETY OFFICE BEARERS

President
Dr T.R.New
Zoology Department
LaTrobe University
Bundoora Vic 3083
Ph (03)4791111
Fax (03)4785814

Secretary
Mr J.D.Sandow
I.C.I. Crop Care
12 Dampier Road
Welshpool WA 6106
Ph (09) 4512899
Fax (09) 4514418

Chief Editor
Dr N.W.Heather
DPI Entomology Branch
Meiers Road
Indooroopilly Qld 4068
Ph (07)3779382
Fax (07)3710766

Technical Editors
Dr B.K.Cantrell
DPI Entomology Branch
Meiers Road
Indooroopilly Qld 4068
Ph (07)3779418
Fax (07)3710766

Dr P.G.Allsopp
Sthn Sugar Experiment Stn
Box 65
Bundaberg Qld 4670
Ph (071)793228

Dr D.J.Rogers
DPI Entomology Branch
Box 23
Kingaroy Qld 4610
Ph (071)621355
Fax (071)623238

Vice President
Dr T.J.Ridsdill-Smith
CSIRO Entomology
Private Bag
Wembley WA 6014
Ph (09)3870640
Fax (09)3876046

Immediate Past President
Mr T.Passlow
30 Dumbarton Drive
Kenmore Qld 4069
(07)3784053

Treasurer
Ms A.R.Hill
Entomology, Agric.Dept.
Baron Hay Court,
South Perth WA 6151
Ph (09)2228298
Fax (09)3681205

Business Manager
Mr J.F.Donaldson
DPI Entomology Branch
Meiers Road
Indooroopilly Qld 4068
Ph (07)3779419
Fax (07)3710766

Public Officer
Dr I.D.Naumann
CSIRO Entomology
P.O.Box 1700
Canberra. ACT.2601
Ph (062) 465236
Fax (062)470217

Assistant Secretary
Dr D.F.Cook
Entomology, Agric.Dept.
Baron-Hay Court
South Perth WA 6151
Fax (09)3681205

Assistant Treasurer
Dr D.K.Yeates
Entomology, Agric.Dept.
Baron-Hay Court
South Perth.WA.6151
Ph (09)3683246
Fax (09)3681205

News Bulletin Editor
Dr G.B.Monteith
Queensland Museum
P.O.Box 300
South Brisbane Qld 4101
Ph (07)8407699
Fax (07)8461918

Assistant Bulletin Editor
Mr G.I.Thompson
Queensland Museum
P.O.Box 300
South Brisbane Qld 4101
Ph (07)8407690
Fax (07)8461918

(Office Bearers continued on rear cover)

THE COVER

The cover illustration for this year's "Myrmecia" features an illustration from the forthcoming new edition of "Insects of Australia" which is due to be launched at the Society's conference in Canberra in July. The illustration is by Ann Hastings, one of the CSIRO artists who have been working on the numerous new plates for the book. The species shown is *Sarothrias lawrencei* Lobl & Burkhardt, a member of the Jacobsoniidae ,a family which appropriately enough had no described species from Australia at the time of the first edition. *S. lawrencei* is a tiny, rare species from the rainforests of North Queensland and has distinctive scale-like setae on the antennae and tracts of silvery tomentum on the body.

NOTICE

Statements made in "Myrmecia" do not necessarily represent the views of the Australian Entomological Society. Items printed herein should not be referred to or reproduced without permission of the author of the material.

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MYRMECIA

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EDITORIAL

In the last "Myrmecia" I commented on the retrenchment of taxonomists from the CSIRO Australian National Insect Collection in Canberra. In doing so I referred to a statement of Dr Henzell's in "the Australian" of October 31, 1989. To correct my interpretation of it I reproduce it here: "We have passed the point where we are making cuts to trivial research." In other words Dr Henzell was not suggesting that the taxonomists' research was trivial. The situation regarding the status of the retrenched taxonomists remains somewhat fluid and the Minister for Science, Barry Jones, recently advised a member that "one of the taxonomists has accepted a part-time position with the Division, one has been retained in employment and one has accepted reduncy, although it is expected he will seek an honorary research fellowship." The Minister pointed out that "it is felt that reducing dependence on pesticides in the cotton, wool, sugar and horticultural industries and protecting timber against termite attack, is of higher priority than taxonomy. Accordingly, work in these areas is in the process of being built up."

GEOFF MONTEITH
Myrmecia Editor

Copy deadline for next issue

Material for publication in the May 1990 issue of "Myrmecia" should be in the hands of the Editor, Geoff Monteith, at his address on the inside of the front cover by **Friday, April 20**. Fax transmission may be used to (07)8461918 but care should be taken to ensure legibility.

Myrmecia advertising rates

	Single Issue	Four issues (One Year)
Full Page	$60	$180
Half Page	$35	$105
Quarter Page	$24	$72

These rates apply to camera ready copy supplied by the advertiser. Where this is not supplied a small additional charge may be made for preparation of the layout. In addition, loose inserts supplied by the advertiser will be included for $50 per enclosure. These should be of a size which will not project beyond the pages of "Myrmecia".

Executive Quarterly Report

MEETINGS

The Executive met on October 26, November 16, December 7, 1989, and January 15, 1990.

MEMBERSHIP

The Executive accepted 14 nominations for membership and elected 12 new members. The distribution of members is as follows:

QLD	180	WA	44
NSW	158	TAS	29
ACT	115	NT	14
VIC	99	O/S	62
SA	66	Address Unknown	6

Membership by categories is:

Full	590	Honorary	6
Student	93	Joint	24
Retired	60	TOTAL	773

The Executive accepted resignations from:
Dr I.R. Bock, Dr F.B. Michaelis and Dr E.R. Sinclair.

TERMINATIONS

The following members will now be struck off in accordance with clause 21(c) of the Constitution.

Mr A. Alishah	F O/S	Mr C.J. Irvine	R VIC
Mr P. Allingham	F QLD	Mr R.C. Joshi	F O/S
Mr D.R. Booth	F NT	Dr C.L. Phillips	F SA
Mr A.C. Champion	S NSW	Dr P.L. Robertson	R NSW
Mr G.W. Cornwell	S ?	Miss A.E. Simpson	F NSW
Mr S.L. Doggett	F NSW	Mr H.A. Standfast	F QLD
Mr P.D. Fuhlbohm	F SA	Mr J.A. Sutherland	F O/S
Dr K. Gibb	F NT	Mr J.F. Tomasov	S VIC

ADDRESS UNKNOWN

The Secretary would like to hear from anyone who knows the addresses of the following members:

Mr G.W. Cornwell	Dr A.J.E. Orian
Mr T.R. Glare	Dr W.A. Palmer
Mr N. Nikolakopoulos	Miss C. Satasook

NEW MEMBERS

WE WELCOME THE FOLLOWING NEW MEMBERS:

Elected October 26, 1989

Mr T. Kerlin, 45 Amethyst Street, Bayview Heights, Cairns, QLD 4868. Tim is a student at the Queensland Agricultural College. He is currently studying the effects of some agricultural chemicals on a predator of the citrus mealy bug.

Mr S. Harrington, BSc(Hons), MSc, 7 Alfred Road, North Fremantle, WA 6159. Sue has recently joined the Western Australian Department of Agriculture where she will be involved in biological control projects for various caterpillar pests. She has worked previously with forest and carrion insects.

Mr J. Zhang, MScAgr, Department of Plant Pathology and Agricultural Entomology, University of Sydney, NSW 2006. Junxiong has worked in medical entomology and in integrated pest control. He is interested in the effects of insecticides on insect biochemistry.

Elected December 7, 1989

Mr G.C. Cope, DipMechEng, 44 Russell Avenue, Faulconbridge, NSW 2776. Gerald is the state manager of a refrigeration company. His amateur interests in entomology have been stimulated through working in isolated locations in Central and South America and Africa. He has a special interest in the Lepidoptera.

Mr A.S. Green, BAgSc(Hons), 6 Aranson Avenue, Magill, SA 5072. Andrew is an integrated pest management consultant for citrus, apricot, almond, avocado and rockmelon growers. He has recently worked on the control of storage pests of almonds.

Mrs S.A. Kulkarni, BSc (Karnataka), MSc (Dharwar), Department of Zoology and Botany, Monash University, Clayton, VIC 3168. Sarita is a Masters Degree (Preliminary) student at Monash University with a keen interest in sericulture.

Elected January 15, 1990

Mr M.L. Dillon, BSc, DipCompSci, CSIRO Heliothis Research Unit, PO Box 59, Narrabri, NSW 2390. Martin becomes a joint member with his wife Gina. He is an experimental scientist interested in computer modelling and the ecology and population biology of *Heliothis*.

Dr D.A. Haugen, BSc, MSc, PhD, Department of Entomology, Waite Agricultural Research Institute, Glen Osmond, SA 5064. Dennis is a post doctoral fellow with interests in forest entomology and in particular the biological control of *Sirex noctilio*.

Mr P. Hunt, BAgrSci, DipAp, Plant Research Institute, Swan Street, Burnley, VIC 3121. Peter is an apiculturalist studying the mandibular pheromones of queen bees and their effects on honey and brood production.

Ms C. James, BSc(Hons), Department of Entomology, University of Queensland, St Lucia, QLD 4067. Christina studied for her honours degree in 1989. Her interests include the ecology of rainforest streams and genetic polymorphism in the Lepidoptera.

Miss M.L. Sommer, BSc(Hons), Zoology Department, James Cook University, Townsville, QLD 4811. Margaret also studied for her honours degree in 1989 and is interested in plant/insect mutualisms. Her hobbies include photography and bushwalking.

CHANGES OF ADDRESS OR TITLE

Mr G.R. Allen, Department of Entomology, University of California, Riverside, CA 92521, USA (SA).

Mr M.F. Braby (Correction to initial).

Dr D.F. Cook, 9 Karo Place, Duncraig, WA 6023 (WA).

Dr M.W.J. Crosland, Department of Entomology, University of California, Davis, CA 95616, USA (NSW).

Mr P.R. Davis, Agriculture Protection Board, Baron-Hay Court, South Perth, WA 6151 (WA).

Mr K. Farrow, PO Box 229, Garbutt, QLD 4814 (QLD).

Ms A.R. Hill, 8a Baldwin Avenue, Mt Pleasant, WA 6153 (WA)

Prof G.W. Howard, 138 Leicester Street, Parkside, SA 5063 (SA)

Mr L.S. Kuniata, Imperial College, Silwood Park, Ascot, Berkshire, SL5 7PY UK (Until September 1990) (O/S)

Mr A.S. Molyneux, Agricultural and Veterinary Chemicals Section, DPIE, GPO Box 858, Canberra, ACT 2601 (QLD)

Mr C. Nadolny, Department of Ecosystem Management, University of New England, Armidale, NSW 2351 (NSW).

Dr K.D.Z. Samuels, c/- Incitec Ltd, PO Box 140, Morningside, QLD 4170 (SA)

Dr H. Spencer, Private Mail Bag 5, Cape Tribulation via Mossman, QLD 4873 (NSW).

Mr G.B. Smith, Bayer AG-BGUT, Pflanzenschultz zentrum, Monheim, Leverkuzen 5090, West Germany (NSW).

Mr P.J. Wilson, 49 Despontes Street, Marrickville, NSW 2204 (NSW).

Mr I.J. Wood, 7 Little Queen Street, Newtown, NSW 2042 (NSW).

FROM THE MINUTES

Conservation Committee

The Conservation Committee has been very active over recent months preparing submissions and recommendations on tourism in the Antarctic and conservation of endangered species, amongst other issues. The Committee Convenor, Ms Penny Greenslade, attended a National Conference on the Conservation of Threatened Species and their Habitats early in December. The meeting was organised by the Australian Committee for the International Union for the Conservation of Nature and was an important forum for determining Government policy on conservation of endangered species. The Executive is keen for the Society to play a prominent role in influencing Government policy in environmental issues. The work of the Conservation Committee and its tireless convenor is much appreciated.

Student Award

The call for applications for the Student Award appears again in this issue. Last year's award attracted 9 entries of very high standard. The judges had such difficulty separating them that an additional prize was presented to the runner up.

The Executive is hoping for a similar response this year. Members who have contact with students should encourage them to compete. The work needs to have been completed whilst enrolled as a full or part-time student and written up within 3 years without substantial modification.

Intention to submit an entry should be indicated on the proforma on the back of the advertisement.

Mackerras Medal

Members are reminded that nominations for this award close on March 16. Candidates who have made outstanding contributions to entomology should be nominated by not fewer than 2 financial members of the Society. Details of the requirements for nomination appear elsewhere in this issue.

Research Grants

The second round of the Australian Entomological Society Research Grants appears to have caught members by

surprise. Four grants ranging from $400 to $2400 were announced in November and the call for new submissions appeared in the same issue. The Executive has now extended the closing date for applications to March 30. Further details of the grants can be obtained by writing to the Secretary

Vale

The Executive recorded with deep sorrow the passing of Dr P.B. Carne. An obituary appears elsewhere in this issue of "Myrmecia".

OPTIONAL AIR MAIL RATES FOR OVERSEAS MEMBERS

At normal membership rates The Journal and "Myrmecia" are sent to overseas members by surface mail. The Society now offers an optional "economy air" postal surcharge rate for these members who would like to get their periodicals by air delivery. Members may choose to obtain either or both "Myrmecia" and the Journal in this manner. The following tabulation shows the different rates of surcharge in Australian dollars for the different postal zones. Any overseas member interested in partaking of this service should send the amount to the Treasurer and nominate which periodicals are required by air.

Economy Air Surcharge

	One Periodical	Two Periodicals
Zone 1 (NZ, PNG)	2.00	4.00
Zone 2 (Indonesia, Malaysia Pacific)	4.00	8.00
Zone 3 (Asia)	6.00	12.00
Zone 4 (USA, Hawaii, Middle East)	6.00	12.00
Zone 5 (Europe, USSR, Africa, South America)	8.00	16.00

Regional News

AUSTRALIAN CAPITAL TERRITORY

CSIRO Division of Entomology

The mob from the Stored Grain Laboratory have been travelling again. Peter Annis and Jan van Graver went to Thailand in November to run a practical course in fumigation and controlled atmosphere technology for insect control in bag stacks. Good to see the transfer of Aussie technology and know-how in action.

Jane Wright attended a workshop on trapping stored product insects and the annual meeting of the Entomological Society of America in Texas in December. As a member of the organising committee for this year's meeting in Canberra, she was carefully noting the details of organising such a meeting and came away incredibly relieved that we won't have 2800 delegates and 1700 papers to organise into 15 concurrent sessions!

Paul Wellings spent a month overseas organising a new project to evaluate resistance of Australian wheat varieties to the Russian wheat aphid. Because an introduction to Australia is most likely to come from the USA, it was decided to use American rather than French aphids in the work at Montpelier, France. So Paul travelled to Stillwater, Oklahoma to acquire the aphids and then took them to France, where all work is being done in quarantine. He spent two weeks establishing the cultures and designing the screening protocol. He then underwent a self-imposed quarantine period, staying far away from aphids for 10 days, visiting various institutions in the UK before returning home.

In other news from Montpelier, the Hon Barry O. Jones MP, Minister for Science and Small Business, signed a memorandum of understanding with the local French research organisation regarding the establishment of our new lab and admitting CSIRO as the first foreign associate member of AGROPOLIS, the International Center for Medical and Tropical Agricultural Research. CSIRO is currently negotiating the price and conditions on the chosen block of land. The first stage will be the construction of glasshouses in June, followed by the laboratories in September.

The new quarantine facility at Black Mountain was opened officially by the Hon J.C. Kerin, Minister for Primary Industries and Energy on 7 December. All of the programs of

the biological control of weeds section were on display for the benefit of the many politicians and visitors in attendance.

Mr Wang Jinxian has just started a PhD program, working on the population dynamics of entomopathogenic nematodes in vivo and in vitro. His supervisors are Robin Bedding of CSIRO and Warwick Nicholas of the ANU.

Richard Milner has just returned from a trip to the UK where he visited Rothamstead, CIBC at Silwood Park, ODNRI at Parton Down and Bath University in relation to his work on *Metarhizium*. Currently, he has a visitor from the USDA at Cornwell University for two weeks. Dr Mark Ramos is collecting fungal pathogens of grasshoppers for potential use as biological control agents for native hoppers in the USA.

Marina Tyndale-Biscoe has been working on redistributing exotic dung beetles, with a grant from the Dairy Research Council. She has been collecting dung beetles in the Canberra region and shipping them primarily to dairy officers in Victoria and Tasmania, who then make substantial releases on farms about 100 km apart. Marina has worked on the dung beetle project for a long time, through thick and thin, and to be able to go out with an assistant and collect over 40,000 beetles of 2 species in an hour is most satisfying. James Ridsdill Smith recently travelled from Perth to talk to Keith Wardhaugh about dung beetles for WA. Keith will be importing Spanish beetles specifically for WA in the near future.

Besides his role as Deputy Chief of the Division, David Evans is also a member of the Wheat Research Council and spends much of his time - some say too much - on Council business. He points out that the Council is interested in receiving proposals on insects and related pests that could contribute to improving productivity and grain quality while lessening dependence on chemicals. The Council seeks to promote research on pest control procedures that will be safe to use and environmentally acceptable. It also wishes to foster the research needed to provide radical new approaches to wheat-related problems as well as that which deals with shorter term day-to-day issues.

ANIC/ANU

The CSIRO National Insect Collections have been visited by several overseas scientists in the past two months. Charlie and Lois O'Brien, studying aquatic weevils and fulgoroids respectively paid an unseasonally early visit from Florida to study the collections, discuss weevilly matters with Zimmie and make some field excursions. Gerhard Tarmann from Innsbruck, Austria worked for several weeks with ABRS support, intensively studying and collecting procridine Zygaenidae and we look forward to a second visit later this year. Contemporaneously, Michael Shaffer, the pyralid specialist in the Natural History Museum, London, spent time sorting the ANIC Pyralidae. Together with Ebbe Nielsen and Bart Hacobian, Michael is helping with the Pyralidae for the *Checklist*. Further visitors to the Lepidoptera unit included Max Moulds (Sphingidae), Bart Hacobian and Bert Orr (Pyralidae).

Charlie Webb (Northern Territory University), taking a break from administration, tested his microdissection and scanning electron microscope skills while visiting Pete Cranston to work with chironomid larvae.

From Japan, two more myrmecophiles arrived, Professor Abe (Kyoto) University and Dr Masuko (Tokyo University), joining the resident Kazuo Ogata for some field work (*Nothomyrmecia* revisited) and in the case of Professor Abe some additional work on Australian termite ecology and evolution. Roger Kitching's canopy fogging program is generating the expected large numbers of insects and Genevieve Carruthers (University of New England) spent some time with us trying to identify some of the most abundant orders. The Orthoptera unit is graced by the presence of Nina Wedell (Stockholm) who is studying the reproductive strategies of tettigoniids through the summer. David Rounsevell (Tasmania) spent some time with Penny Greenslade and others, checking progress on the Tasmanian rainforest collections. Penny, Ian Naumann and Ebbe undoubtedly will increase this collection when they visit more of the World Heritage area in February.

Penny Greenslade's activities in conservation are documented elsewhere in this and the previous issue of *Myrmecia* and others in ANIC have been undertaking "green" research. Ted Edwards took a break from the *Checklist* Noctuidae to search locally in an attempt to document the remnant populations of Castniidae in native grasses and sedges. The past few months have seen a bevy of students abstracting data from our collections for potential use in confirming the biological validity of the World Heritage boundaries of the Queensland wet tropics. The change in government in Queensland averted the need for these data to be challenged in court but we hope that this study sets a precedent in use of such information in conservation issues.

Recent news that 'Insects of Australia' should appear in time for launching at the Annual Meeting of the Society is welcome, but when is anyone likely to get the time to look at the proofs? Jo Cardale is now adept at 'Word' and knows every reference in the work by heart.

Penny Gullan nears completion of her peripatetic sabbatical leave by commuting between ANIC (where she avoids most students) and ANU (where she doesn't). Sharing the office in ANIC is Shelly Rozario who is capable of handling at least three part time jobs simultaneously — good training for the PhD she will shortly commence with Dennis O'Dowd at Monash University. Shelly will be missed here by her friends and colleagues in the Division and at the University.

Sunita Bhatti's thesis on the systematics of Australian monophlebuline margarodids has been accepted for a PhD. Sunita is now in Edmonton, Canada where she hopes to continue her work on scale insects. Penny's second recently successful postgraduate student, Ting Kui Qin has had his thesis on the taxonomy of Australian soft scale of the genus *Pulvinaria* accepted for an Overseas Postgraduate Research Award and funding from the NSW Central Coast Citrus Marketing Board and Horticultural Research and Development Corporation via a grant to Andrew Beattie (NSW Ag & Fish) to do a PhD at ANU on the phylogeny and biogeography of wax scales (genus *Ceroplastes*) including some important plant pests.

Coopers and Cladistics continues its iconoclastic course, welcoming transient discussants from overseas as well as Adam Marchant (Research School of Biological Sciences, ANU) who hopes to get funding to continue some entomological work with molecular studies on scale insects and their host plant galls. Ebbe Nielsen is spending much time effectively organising the forthcoming (August 1990) Canberra meeting of the Willi Hennig Society - a meeting that may differ from the informality of the Cladistics group but will undoubtedly use the same lubricant.

PETE CRANSTON AND JANE WRIGHT
Regional Councillors

QUEENSLAND

SOUTH EAST QUEENSLAND

Lands Department, Alan Fletcher Research Station

Rachel McFadyen spent 3 weeks in Argentina during Nov/Dec visiting old friends in Tucuman and discussing the *Parthenium* project there with Lands Department entomologist, Dr Cesar Garcia.

Qld Forestry Service

The Forestry Department is now a Division of the Department of Primary Industries following the change of state government. Judy King and Chris Fitzgerald have commenced duties as extension officer and technician, respectively. Both joined the group from the Entomology Department of the University of Queensland.

University of Queensland

Ms Rayleen Camp has been appointed as a technician within the department. Rayleen replaces Chris Fitzgerald who has gone over to the Queensland Forestry Service.

Completion of the long awaited 12 volume checklist "Culicidae of the Australian Region" was celebrated with a book launch attended by the media on the 7 December 1989.

Pat Marks (left) and Joan Bryan at the launch of the 12 volume "Culicidae of the Australian Region".

Two of the authors, Pat Marks and Joan Bryan, were on hand to detail the history of this mammoth endeavour and explain its importance as a resource for mosquito researchers. Sets can still be obtained from Joan Bryan, Entomology Department, University of Queensland, St Lucia, Qld 4067. Price is $50 plus postage made payable to the University of Queensland.

CSIRO, Long Pocket

Bob Sutherst was appointed leader of the CSIRO Institute of Plant Protection and Processing's working party on climate change. The working party's first report is on the impact of climate on agriculture and is nearing completion. One aspect of the report is the likely impact of the Greenhouse effect on spread of pest insects. Gus Macqueen transferred from buffalo flies and dung beetles to horticultural pests with Don Sands. Gus and Don currently are on a trip to review ARC projects on horticulture in the South Pacific. Jim Nolan takes over from Ken Bremner as officer in charge at Long Pocket laboratories after 1 March. Wendy Forno participated in the 1st Asia and Pacific Entomology Conference in Chiang Mai in Thailand, presenting a paper and poster on biological control of *Mimosa pigra*. After this she went on to Mexico to survey Pacific and Gulf coasts for insects attacking *Mimosa pigra*.

Griffith University

Jane Hughes and Meron Zalucki recently received an ARC grant to study the genetic and environmental components determining flight activity of Monarch butterflies and *Heliothis*.

DPI Entomology Branch

Christine Neale (U of Q) has submitted her MSc thesis on "The Specific-Mate recognition systems of *Dacus tryoni* and *Dacus neohumeralis*", and joined the Insect Pathology Section at Indooroopilly to study feeding behaviour of *Helicoverpa* spp. on cotton treated with microbiochemical insecticide mixtures.

The project "Implementation of Integrated Mite Control in Apples" is off to a good start in the Stanthorpe area. Frank Page reports that a good build up of predators has occurred in some blocks and miticides have not been applied to these blocks. Other blocks in the district have received up to two applications for European Red Mite.

Franz Dopperman of Sandoz has been testing a new miticide on apples and Frank Page will be looking into its safety to the mite predators, particularly *Typhlodromus pyri*.

Bureau of Sugar Experiment Stations

Dr Ron Cherry returned to Florida after spending 6 months sabbatical working on canegrubs. He carried away a substantial quantity of Australian memorabilia, including two didgeridoos!

Peter Allsopp visited the Waite Agricultural Research Institute in January, to discuss biological control of sugarcane mealy-bug with Mike Keller. While there, he met up with Paul (Wheels) de Barro, who previously worked at Bundaberg.

University of Queensland — Gatton College

During November Errol Hasson was involved in 2 training courses, the first was conducted for Hoescht on cotton production and protection. The second course involved training TAFE teachers in aspects of pest identification and control.

The official consolidation of U of Q and QAC occurred on 1st January. The college will now be known as University of Queensland — Gatton College.

The Rural Projects Club of Queensland attended summer schools at Gatton College during January. All of the young students were impressed by the "pretty butterflies and big beetles" in the Entomology Section.

Queensland Museum

Rudy Kohout is just back from his 6-week tour of overseas museums funded from his Society Research Grant announced in the last *Myrmecia*. He visited museums in Paris, Geneva, Genoa, Vienna, Frankfurt, London and Oxford to examine their holdings of the ants of the genus *Polyrhachis* which he studies. He reports great success in achieving most of the objectives of the tour and he was able to locate previously missing types and establish true identitities for a number of species of Australian *Polyrhachis*.

The Governor's wife, Lady Campbell, inspected the Dodd Collection in early December. Parts of the collection will be displayed in conjunction with a major temporary display of 90 of the Museum's 125 flower paintings by turn-of-the-century travelling artist Ellis Rowan which opens on March 2. Many of Ellis Rowan's flower paintings include insects and Geoff Monteith has identified these and contributed an explanatory chapter on them in a book on the artist's Queensland travels by art-historian Judith McKay to be launched at the opening of the display at which Lady Campbell will officiate.

Kevin Lambkin has been made an Honorary Associate of the Museum. Though he works in a wider milieu as a

parliamentary research officer these days he stills trys to keeps his entomological hand in with his interests in Mecoptera, Neuroptera and fossil insects.

Gordon Gordh, from University of California at Riverside visited Ted Dahms in December to discuss their large joint manuscript on the Australian Encyrtidae which has kept Ted busy for the last few years.

Dates have now been set for the 12th International Congress of Arachnology which will be held July 12-18 in 1992 at the Queensland Museum. Preliminary leaflets will be avilable soon and will be sent to those lodging their names with Val Davies, Secretary of the Organising Committee, at the Museum.

DES FOLEY AND
PETER TWINE
Regional Councillors

NORTH QUEENSLAND NEWS

Richard Piper started work in January for the Queensland DPI. Based at South Johnstone, he is involved with a program to develop IPM for the banana industry in the Innisfail\Tully area.

Ernst Heiss from Austria spent several days on the Atherton Tableland pursuing elusive aradids and flights to southern centres.

Bruno Pinese visited Perth and Kununurra in regard to a reported outbreak of banana weevil borer. *Cosmopolites* was indeed active at the Ord and causing growers some problems.

Harry Fay attended the First Asia-Pacific Conference of Entomology in Chiang Mai, Thailand. He also spent time looking at fruit sucking moth problems and research in the area.

Marie Ablin from the Lands Department research station in Charters Towers gave talks in Tully and Mareeba. Amongst other things she discussed the recent introduction of the chrysomelid *Calligrapha pantherina* against the weed *Sida acuta*.

Geoff Strickland from the Department of Primary Industries and Fisheries in Darwin visited the Queensland DPI lab in Mareeba while on a long service leave trip around Australia. He discussed a forthcoming workshop on tropical Entomology to be held at James Cook University in Townsville in July 1991 with its organiser Ian Cunningham.

Max and Barbara Moulds made one of their many trips to north Queensland in December/January. Max had in hand the first copy of his book on Australian Cicadas. Trips were made to Coen and Normanton. On a hot night's light trapping on Mt Lewis they took 5 specimens of *Phalacrognathus muelleri*, much to the annoyance of Jack Hasenpusch (Innisfail), Graham Wood (Atherton) and Cezary Rojewski (Melbourne) who were also lucanid stalking there on the same evening.

Angus Macqueen visited Mareeba to discuss fruit sucking moth research with Dr Harry Fay. Gus has recently been included in the CSIRO's programme on the pests, working with Dr Don Sands at Long Pocket.

Ross Storey spent 5 days over Christmas light trapping at Cape Flattery, north of Cooktown.

The latest in a series of speleological expeditions to the Chillagoe caves sponsored by the Explorers Club of New York took place over a six week period in December-January. Fred Stone, from Hawaii, pursued cave cockroaches at both Chillagoe and Undara (and incidentally bestowed the name "Bug Heaven", for obvious reasons, on a newly explored chamber at Chillagoe). Alan Dyce and Glennis Wellings, from Sydney, arrived to survey the *Phlebotomus* midges of the caves while Dick Smith, as partial sponsor of the expedition, arrived at the caravan park in his trademark helicopter to inspect proceedings. The locals, long accustomed to such subterranean goings on didn't bat an eyelid.

Geoff Monteith and Geoff Thompson, from the Queensland Museum, spent two weeks mountain-top collecting in the Tully-Atherton-Kuranda region in December. Then they joined the 70-strong ANZSES expedition at Mt Carbine for a week to co-ordinate an insect collecting programme by its entomology team under the leadership of Jamie Seymour from James Cook University. Jamie subsequently led his group on a month's back-packing through the mountainous Carbine Tableland. The rich collections from many techniques including pitfall and intercept trapping and pyrethrum knockdown have now arrived at the Queensland Museum. Most exciting are 2 males and 2 females of *Sphaenognathus australicus*, a stag beetle belonging to a South American genus and described only recently from NQ. A 60mm male of *Phalacrognathus muelleri* was also taken.

ROSS STOREY
Regional Councillor

SOUTH AUSTRALIA

Department of Agriculture

Graeme Baker, Department of Agriculture and Fisheries, Rydalmere, visited the Department of Agriculture to advise on biological control of wingless grasshoppers. He addressed farmer's meetings in the south east of South Australia on the topic.

CSIRO Soils Division

Geoff Baker has returned from two months in Montpelier, France, where he collected natural enemies of white snails with Agnes Espian, a locally appointed Entomologist. Cultures of the parasitic sciomyzid fly, *Salticella fasciata* have now been imported to the South Australian Department of Agriculture's quarantine insectary where they will be reared for host-specificity testing against Australian snails in a joint project between Geoff and Dennis Hopkins and Mark Newton of the SA Ag Dept. Other parasites (e.g. sarcophagid flies) of the snails were also found in Europe, as were hyperparasites. These have yet to be identified.

Visitors to Urrbrae have included Blair McKenzie (Melbourne), Bernard Doube (Canberra) and James Ridsdill Smith (Perth).

South Australian Museum

Jan Forrest and David Hirst went collecting in the Gawler Ranges north of Eyre Peninsular early in December. Because it was moist for early summer there were good collections, heaps of wasps and bees and possibly new species even amongst the larger arachnids (scorpions, huntsmen and mygalomorph spiders).

Dr Giovanni Mineo from the University of Palermo, Sicily, spent a few weeks studying our scelionid parasitic wasps, including those in the Dodd collection; Dr Michael Schaeffer from the British Museum of Natural History spent a day trying to locate some pyralid moth types.

Department of Zoology, University of Adelaide

Alice Wells paid a short visit to the Museum of Victoria in November to discuss some of the problems with her Alligator Rivers (NT) caddisfly studies with Arturs Neboiss, John Dean and David Cartwright.

Waite Institute — Department of Entomology

The department is close to capacity at the moment with all the academic staff and several visitors happily ensconced. Professor Bob Wharton from Texas A&M is visiting for approximately 5 months working with Andy Austin (on the systematics of Braconids) and Mike Keller (on the behaviour of *Cotesia*) and Professor Koji Hori (Obihiro University, Japan) is spending several months working with Peter Miles on the salivary physiology of the green luceme mirid. Dr Victor Eastop visited for a week last December avidly discussing aphids with several members of the department, and Peter Allsopp from BSES, Bundaberg visited for several days in January, discussing biocontrol measures with Mike Keller.

We were sad to see several departures from the department; Val Burnyoczky has retired, and Janet Walker and Robyn Puckridge have resigned from the department. Ian Dadour has also left to take up a position in Western Australia.

On a happier note, the department's new quarantine, glasshouse and insectary complex was officially opened in December.

DUNCAN MACKAY AND
ALICE WELLS
Regional Councillors

NORTHERN TERRITORY

Generally, things have been rather quiet in the Top End over the past three months as many people take leave over the Christmas and monsoon period. However, some of us struggle on ....

Department of Primary Industry and Fisheries (DPIF)
DPIF, Weeds Section

Colin Wilson and Grant Flanagan are over the moon with the progress of all their biological control agents. A planned 'before- and-after' field experiment featuring the mimosa moth *Neurostrata* has had to be reassessed as most of the 'befores' are already 'afters'. During December, Colin Wilson rendez-voused with Graham Donnelly of the Queensland Department of Lands at Barkly Homestead for the first NT release of the parkinsonia mirid bug *Rhinacloa*.

DPIF, Agricultural Quarantine Section

Ted Fenner visited the Kimberleys and parts of the Pilbara in Western Australia during early December for a consultancy on palm leaf beetle following its discovery in

Broome earlier in the year. During the two week trip, Ted examined a wide sample of palms from Dampier to Derby and Kununurra/Wyndham.

DPIF, Entomology Section

Specimens of a thrips collected from watermelons and zucchini crops in June were identified during the month as *Thrips palmi* Karny (Thysanoptera: Thripidae), a species not previously known from Australia. This species, native to the Malaysian/Indonesian area has now been recorded from seventeen horticultural crops in the Darwin/Berry Springs and has caused a flurry of media and, of course, quarantine interest.

Most of the Section's staff were involved with disinfesta-ttrials on mangoes during October and November. In all, 2352 mangoes were tested for fruit damage due to the treatments imposed or for fruit fly mortality. Only now are we able to enjoy eating the frozen fruit put aside at that time.

During October, a heavy infestation of *Aphis gossypii* appeared on rockmelons on one grower's property in the Top End. These aphids, which had not previously been recorded damaging cucurbits in the NT caused considerable economic loss to the grower before being brought under control.

In November, Prof Charles and Dr Lois O'Brien of Florida A&M University visited to examine aquatic weevils and Fulgoroidea respectively in the Section's reference collection.

Leigh Miller of CSIRO, Canberra also visited during that month to collect *Mastotermes* at Kapalga and to test a fluorescent dye to trace colonies. Wayne Houston assisted Leigh in these and other trials on *Mastotermes* control using a biological agent (nematodes) and a chemical agent (mirex dust) during his two week field trip.

Geoff Strickland appeared back in Darwin just before Christmas after long-service leave. He appears very fresh, although not many people would call six months towing a caravan around Australia, with the missus and two young kids aboard, a holiday!

NT Health — Medical Entomology Branch

The Branch's joint virus monitoring program with the Department of Primary Industry and Fisheries continues to yield interesting results, including the widespread occurrence of Barmah Forest Virus. Wendy Kelton is continuing the collection and processing of the current wet-season crop of mosquitoes.

Peter Whelan reports that the DNA probes for the three Australian species of *An. farauti* have now been base-pair sequenced under a joint Branch/Menzies School of Health research project and that the initial paper on the probes can be expected soon.

The joint Branch/Darwin City Council task force review of mosquito control in Darwin has been submitted to Cabinet and recommendations have been made on source reduction and other control operations.

Paul Barker-Hudson spent two weeks in Townsville recently renewing acquaintances and furthering his Masters work.

Gwenda Hayes from the Museum has been temporarily transferred to the Branch for training and is quickly picking up mosquito identification skills.

Scott Plummer has been filling in for Graham Dobson on mosquito field monitoring and control operations while Graham returned to New Zealand to turn the lights back on.

Office of the Supervising Scientist, Alligator Rivers Region

Peter Dostine reports that OSS can now boast two Australian Entomological Society members on staff since Dr Greg Rippon joined the Aquatic Toxicology Section in September 1989.

OSS is hosting the Australian Society for Limnology 29th Annual Congress from April 19-23rd. In addition, there will be a pre- Congress symposium on "Water Management in the Alligator Rivers Region". Anyone with interests limnological and tropical can contact Dr Ross Hyne on (089) 799 711.

STUART SMITH
Regional Councillor

NEW SOUTH WALES

SYDNEY METROPOLITAN AREA

Sydney University —
Medical Entomology Unit at Westmead Hospital

Richard Russell has begun an investigation of Lyme Disease in NSW with funding from the NH&MRC, and Stephen Doggett, previously with the Army Malaria Research Unit, has been appointed to the position of Research Assistant for the project. Richard and Stephen will undertake field and laboratory investigations to isolate, identify and study the

causative organism and the tick vectors. In November, Richard attended the Asia-Pacific Conference of Entomology in Thailand, a workshop on arbovirus epidemic control conducted by the Victorian Department of Health, and the Entomological Society of NSW forum on the crisis in education and employment in the insect sciences.

Peter Wells and John Clancy have had little time to breathe a sigh of relief since completing the 1988/89 Arbovirus Surveillance Programme Report and commencing the sorting and processing of this year's mosquito collections. Fortunately arbovirus activity and mosquito numbers for the season to date appear to be lower than they have been in recent years, though good rainfall in the inland during the rest of summer would boost mosquito populations. Our first arbovirus isolates for the season came in November and included Trubanaman virus from Wentworth. Trubanaman is not known to infect humans but has only rarely been isolated.

Richard and Merilyn Geary have begun an investigation of the prevalence of human infection with dog heartworm in NSW, and are continuing their study comparing the susceptibility of several mosquito species to *Dirofilaria immitis*.

Centre for Entomological Research and Insecticide Technology

As a result of the Entomological Society of NSW Forum on the Crisis in Entomological Education, Chris Orton, CERIT Director has become a member of the working party to make submissions to the Department of Employment, Education and Training (DEET) concerning entomological education in NSW.

Two new staff members have joined CERIT. Martin Shivas has replaced Heloisa Mariath on the AWC funded project "Genetic basis for adaptation to oviposition suppres-sants of the sheep blowfly *Lucilia cuprina*". In particular, Martin will be looking at the oviposition behaviour of blowflies. Martin is a graduate of the parasitology Department of the University of Queensland, having worked on ceratopogonid taxonomy and biology. Louise Coady, a UNSW Zoology major student has come to work part time to help Jenny Anderson with the Arid Zone Sheep Blowfly Project.

Andrew Farnham from Rothamsted Research Station UK came to CERIT on 24th January and gave an excellent seminar on mechanisms of resistance in the housefly and a brief run-down on research at Rothamstead. CERIT was filled to capacity with about 40 people attending from industry, agriculture and other universities. Andrew is on his way back home after a brief visit to Australia. CERIT is planning a seminar series for 1990 with an industry related theme. Ideas for possible topics and speakers would be gratefully received by Jenny Anderson, Martin Shivas or Chris Orton on (02) 399 0344.

Jeremy Cocks of Syntex Animal Health visited CERIT to discuss the results of an experiment with New Defiance Oil S marking/mulesing dressing that was carried out at UNSW Fowlers Gap Arid Zone Research Station.

Macquarie University, School of Biological Sciences

Andy Beattie's research on the antibiotic properties of secretions from ant metapleural glands has received a boost in the form of ARC funding. Negotiations with pharmaceutical companies for additional funds, predicably, drag on. Recent advances in the work will be the focus of a visit from the Channel 7 program 'Beyond 2000' during February and TV New Zealand during May. It is hoped that these will be good opportunities to emphasise the importance of entomology. You never know when your papers will be reported by the media - Rod Peakall's work on the pollination of Australian orchids by ants received good coverage by, of all things, The Times (London). The lab will soon start a new project on the effects of ant dispersal of seeds on the genetics of plant populations.

Noel Tait and David Briscoe are continuing their long term affair with that most famous of all 'missing links', peripatus. Now, we know peripatus are not insects but if one can believe that they represent descendants of the group that marched out onto land to give rise to the myriapods and eventually the insects, then without them entomologists would be out of a job. Peripatus have long been considered rare and endangered but, over the past four years, Noel and David have found them everywhere from Cape York to the southern tip of Tasmania along the east coast, around the Adelaide hills and in the south-eastern corner of Western Australia. In these areas, provided there are moist rotting logs and leaf litter to protect them from desiccation, they have been found to be remarkably abundant. They are not confined to pristine forests as Dinah Hales has provided several specimens from her very much disturbed garden in Carlingford. Furthermore, the eight recorded species for Australia has now climbed to over fifty putative taxa, making a considerable advance on the one hundred recorded world wide. The initial recognition of these apparent species is based on allozyme electrophoresis. This study has shown that not only is there a large number of new species in Australia but also they have diverged hundreds of millions of

years ago, long before Gondwana split up. A study is under way to examine the genetics of inter-log populations to throw light on the process of speciation in low vagile creatures. Molecular taxonomy is being backed up by morphology, particularly the discovery of a diversity of extraordinary structures on the heads of males. These are somehow involved in mating as they have been observed to carry a spermatophore. It would seem that some peripatus take a full frontal approach to sex. Also, on the reproductive front, an honours student, Suzanne Elliot, showed that the crural glands on the leg pits of males produce a pheromone attractive to females. Some of this work has now been written up in *Australian Natural History* (Summer 1989) and *J. Nat. Hist.* (1990 in press). It is very likely that there are still more new species waiting to be discovered, so Noel and David are keen to hear from anyone who has come upon peripatus in their travels.

While off the subject of insects, Dinah Hales made an interesting discovery of an aquatic millipede while collecting aquatic insects in the local rather polluted stream that flows through Macquarie University. A few enquiries to myriapodologists (all overseas) revealed that while aquatic millipedes were not unknown, these ones are of special significance in that they occur in a permanent stream rather than ephemeral ones where the others have been reported. The state of millipede taxonomy in Australia is chaotic to say the least. The description of this species should make an interesting sideline for Dinah and at least briefly take her away from her preoccupation with aphids.

In the aphid department, live *Sitobion* or *Rhopalosiphum* on cereals from any part of Australia, are still on the 'wanted' list, and Dinah Hales and Eren Turak continue to check their mail boxes with the hope of finding parcels containing the little green, brown or black beasties.

Forestry Commission of NSW

The new Forestry Commission Research Insectary was formally opened on 11 December 1989 by the NSW Minister for Natural Resources, Ian Causley, MP. It is located at the Wood Technology Branch (WTSRD), Pennant Hills.

Chris Ann Urquhart has been appointed Technical Officer and will be in charge of curating the Forestry Commission's insect collection.

Australian Museum, Sydney

Geoff Holloway, Technical Officer and Collection Manager in the Museum's Entomology Department for almost 25 years, suffered a severe stroke in January on the eve of leaving to take a position as Lecturer in Biological Sciences at Petersham Technical College. Our sympathy extends to Geoff and his family at this time and we wish for a speedy recovery.

David McAlpine and Museum Volunteer John Martin have been continuing their studies of Coelopidae (kelp flies), and John is getting particularly interested in the adaptations of coelopid larvae. David is collecting Diptera in liquid nitrogen for planned studies of the relationships and higher classification of the acalyptrate families using biochemical techniques. Gerry Cassis is continuing his studies of Dermaptera and Hemiptera. Dan Bickel returned from a 6- week trip to the USA and New Zealand. As well as spending 10 days sorting some of the vast Australasian and Oriental holdings of the Bishop Museum, he was also able to visit the American Museum of Natural History and the Smithsonian Institution. On the way back he spent two weeks collecting on the North Island and sorting at the New Zealand Arthropod Collection, Auckland. Geoff Williams is in the final stages of completing a book on the rainforests (which places emphasis on the flora and invertebrate fauna) of the Hastings-Manning drainage.

Visitors to the Entomology Department included: Allen Keast from Queens University, Ontario; Risa Rosenberg and Penny Kukuk, both on postdoctoral fellowships at the University of NSW; Rod Holmes from the NPWS, Dorrigo-Armidale to examine the beetle collection; and Woody Horning from the Macleay Museum to examine little-known entomological literature.

Agriculture and Fisheries BCRI, Rydalmere

David Spole, Technical Officer (Scientific), transfered to the NSW Forestry Commission in early November to take up a position where he will look after their insect collection and oversee their *Sirex noctilio* control program. David has been with the Entomology Branch for the last six years, and during recent years has worked with Barry Wallbank on stored product insect pests. All the best David with your new job!

New faces have appeared in the Branch during recent months. Fadi Saleh commenced working with Barry Wallbank in early November; Laurie Sanchez has been working in Taxonomy since mid December filling in for Graham Brown who has been relieving in the Export and Import Branch; Peter Gillespie commenced as a Technical Officer (Scientific) in early January and will deal with public entomological enquiries.

In late November Paul Hughes and Garry Levot had a visit from Dr J. Oakeshott for the purpose of discussing techniques for the isolation of resistance genes in *Lucilia cuprina*. Meanwhile, in mid December, Graham Baker visited South Australia to view wingless grasshopper infested areas, and present talks at a field day at Wattle Range and the Agriculture Bureau Meeting at Penola.

The University of New South Wales: School of Biological Science

Con Goletsos successfully gained a first-class honours grade for his thesis work on ladybird predation on aphids, and plans to continue this work for a PhD with Aola Richards.

Stella Koulianos has made headway on her honours project to characterise Australian honeybee strains using mitochondrial DNA sequences, but good comparative information awaits the arrival of strains elicited by presenting her project at a queen bee auction at the Richmond campus of The University of Western Sydney in December.

Risa Rosenberg arrived to take up a UNSW postdoctoral fellowship with Ross Crozier late last year, and has been scouring the country for butterfly species with both territorial and non-territorial populations to use for tests of ecological genetic theory.

Penny Kukuk continues her studies on the behaviour of an enigmatic bee situated in south-western Victoria, and has gained wisdom in the shipment of frozen specimens to Montana.

A significant change of personnel approaches, with the departure of Ross Crozier to take the chair of genetics and human variation at La Trobe, despite UNSW's countermove of giving him a personal chair. Some hopefully adaptive dispersal has been engendered, with Mike Crosland departing in February to work with Rob Page in Davis, California, on Africanized honeybees and Christian Peeters off to Japan in April. Other projects will make the move to La Trobe, including those of Risa and Penny, who plan to arrive at La Trobe after blitzing the Northern Hemisphere during its summer. Meanwhile, Ross is looking forward to laying aside the headship at UNSW after March so that he can concentrate on packing!.

Army Malaria Research Unit

In late November Bob Cooper visited Darwin and Daly River, NT, to liase with local authorities in preparation for a month long survey for *Anopheles farauti* s.1. to be conducted by the unit in May, 1990. Bob also visited the Medical Entomology Section, NT Department of Health, for discussions with Peter Whelan and Paul Barker-Hudson.

At the conclusion of 1989 the unit bid farewell to two valued colleagues. Both Stephen Doggett and Richard Piper, who worked with Tony Sweeney on studies concerning microsporidian parasites of mosquitoes, left the unit to commence new positions. Stephen is now working at Westmead Hospital, while Richard is at the Department of Primary Industries Research Station, South Johnstone, Qld.

Overseas visitors were Dr Wilfred Samarawickrema from Sri Lanka, and Dr Richard Montenari, WHO, Port Moresby, PNG.

MERILYN GEARY
AND DAN BICKEL
Regional Councillors

NSW COUNTRY AREAS

NSW Agriculture and Fisheries

Col Bower and Graham Thwaite are bracing themselves in readiness for the transfer from Sydney to Orange of the head office of NSW Agriculture and Fisheries. Their entomological colleagues will not be greatly affected by the move as the Entomology Branch (presently based at Rydalmere, a western Sydney suburb) is not included, at least for the time being!

Head office staff have already commenced "going west", but it will be December 1991 before the bulk of positions (if not the people in them) will be transfered. The relocation will provide country officers with promotional opportunities without the need to live in Sydney.

NSW Agriculture and Fisheries, Yanco

Mark Stevens was awarded his PhD at the University of Sydney in December. Congratulations! It is somewhat ironic that a leafhopper specialist such as Mark is working in one of the few rice-growing areas of the world which does not include leafhoppers among its pests.

Barry Sampson joined the Yanco entomological team in November and is working as a Technical Officer on biological control of Patterson's Curse. Formerly based at Singleton, Barry is now involved in the rearing and release of control

agents at Yanco, which, unlike Singleton, is in the heart of "Curse" country. *Dialectica* appears to have established remarkably well in the Yanco environs. Barry's arrival brings entomological staff at Yanco up to 9 and the Institute is rapidly consolidating its reputation for entomological expertise.

David James has spent a good deal of time searching for trees of Desert Lime (*Eremocitrus glauca*) and native strains of Spined Citrus Bug (*Biprorulus bibax*). Populations of this bug on this native host have been found near Hillston in NSW and Roma and Mitchell in Queensland. He would be extremely interested to hear from anybody who knows of other locations where *Eremocitrus* can be found. David explained his current research on Spined Citrus Bug to the tri-state citrus field day held at Dareton, near Mildura, in November.

Sampling of grapevines from the Riverland of SA, the Sunraysia district and the MIA has commenced as part of the project investigating the possibility of the biocontrol of vine mites. Jenny Whitney is becoming Yanco's most travelled Technical Officer! David James presented a seminar on vine mite research to a meeting of the Grape and Wine Research Council at Griffith in December.

Earth mite studies, unlike the animals themselves, have not gone into diapause for the summer. Biological investigations on Red-legged Earth Mites have provided a welcome break from sampling for Karen O'Malley. Rearing of the little black and red critters still presents some problems, but we are slowly getting there.

Richard Faulder and Jenny Whitney visited Eberhard Schicha at BCRI Rydalmere in December to gain instruction in the art of preparing and identifying phytoseiid mites. The variety of phytoseiids found so far on grapevines has called for gaining some local skills in this area.

NSW Agriculture and Fisheries, Tamworth

Ray Hall, Tamworth's long-serving assistant in Entomology, retired recently. However, Robyn Gunning soon found a way to re- employ him on a casual basis. Ray's skills in insect rearing will be hard to replace.

Andrew Farnham, from the resistance workers' group at Rothamstead experimental station in England, visited Tamworth and Narrabri for a few days in late January. Robyn introduced Andrew to the delights of cotton fields and their insects, particularly *Helicoverpa*. He will take colourful memories of Tamworth back to the UK, as the country music festival was on at the time.

NSW Agriculture and Fisheries, Narrabri

Neil Forrester attended the First Asia Pacific Conference on Entomology in Chiang Mai, Thailand, from 8th-13th November 1989. After the conference he visited the cotton and vegetable growing areas around Bangkok to gauge the extent of the insecticide resistance problem in *Helicoverpa* and *Plutella*. The cotton area in Thailand has declined to a low of around 5,000 ha from a peak of 150,000 ha in the early '80s. There is no doubt that pyrethroid resistance in *Helicoverpa armigera* has been the prime reason for the demise of the cotton industry in Thailand.

Matt Cahill graduated from the University of Cambridge, England, last July, after completing his MPhil. He was awarded the T.H. Middleton prize for his thesis entitled "A Model for the Management of Resistance".

Lewis Wilson is currently heavily involved in field trials to finalise the relationship between spider mites and yield loss in cotton.

CSIRO Narrabri

Gary Fitt, together with Alistair Drake and John Dowse from the radar group in Canberra and two British visitors, Joe Riley and Don Reynolds from ODNRI (Overseas Development Natural Resources Institute), has been busy during January observing the nocturnal activities of *Helicoverpa*. Dr Riley has developed infra-red video techniques which allow 3-dimensional tracking of the flight trajectories of *Helicoverpa* and other moths. Observations have been made on a population of *H. armigera* emerging from a maize crop and moving into nearby cotton crops using radar, night vision techniques and the video system. The biggest problem for *Helicoverpa* research again this season is a lack of moths! Neither *H. armigera* nor *H. punctigera* have been abundant.

Gary Fitt, Alistair Drake, Joe Riley and Neil Forrester will travel to Brisbane in early February for a workshop on *Helicoverpa* research organised by the industry research councils with the aim of organising priorities for research and funding.

New staff appointments at Narrabri include Martin Dillon working on the *Helicoverpa* population dynamics model (HEAPS) and Cheryl Mares working in the general area of host plant resistance in cotton cultivars.

DAVID JAMES
Regional Councillor

VICTORIA

Plant Research Institute, Burnley (DARA)

Our Director, Peter Smith, will be resigning from the Department of Agriculture and Rural Affairs on 2 March 1990, to take up the position of Research Programme Co-Ordinator, Crop Sciences, at the Australian Centre for International Agricultural Research (ACIAR) Canberra. Peter has been with the Department since February 1956, and has spent his entire career at the PRI. His lively, approach and supportive management will be missed by entomologists at Burnley and we wish him well in his new role.

Peter Ridland is managing a large project entitled "Non-chemical Pest Control" which has funding from the Government's Conservation Policy Initiative (Clean Agriculture). A sub-project is investigating the biological and cultural control of caterpillar pests of field crops, and has recently employed two technical assistants: Denis Crawford and Ian Faithfull. Other sub-projects are involved with pest management of conservation tillage systems, integrated pest management of potatoes, integrated control of blackheaded pasture cockchafers and integrated pest and disease management of strawberries.

Burnley has had a number of visitors recently. Dr Christian Laumond from the Station de Recherches de Nematologie et de Genetique Moleculaire des Invertebres, Antibes (France) and his wife, visited Gordon Berg, Peter Williams and Paul Horne in December. They discussed biological control using entomopathogenic nematodes. Dr David Onstad from the Section of Economic Entomology, Illinois Natural History Survey, and his wife, also visited in December. David presented a seminar entitled "Pest Management: Use of Models in Decision Making". Dr Victor Eastop, from the Natural History Museum, London and currently a Sir Frederick McMaster Fellow in Agricultural Science, visited in December. He spent over a week here, discussing aphids with various entomologists, and presented an interesting seminar on "Aphids, Plants and Other Organisms". James Ridsdill-Smith visited in January to talk about laboratory rearing of redlegged earth mites with Bill Frost and control strategies for whitefringed weevils with Paul Horne. Whist at Burnley, he met up with Tim New and, together with Janet Horne and Bill Frost, discussed plans for the 1991 AES meeting which is to be held in Melbourne (July 15-19), Gordon and Joy Burns briefly visited Mali Malipatil and Kelvyn Dunn to examine the buprestids in the PRI Insect Collection.

Institute for Irrigation and Salinity Research, Tatura (DARA)

Ian Barrass has just returned from a trip to Queensland which was in part paid for by the AES Grants. He visited Don Sands at the CSIRO Long Pocket Laboratories, who is working on fruitsucking moths (noctuids with art-deco colouring). The main purpose of Ian's trip was to see first hand how Don's laboratory was succeeding so well at culturing encyrtid wasps. During his week away, Ian also visited Dan Smith and Geoff Waite (DPI, Nambour), Elaine Brough (DPI, Indooroopilly) and Ted Dahms (Queensland Museum).

Sunraysia Horticultural Centre, Irymple (DARA)

Greg Buchanan has temporarily abandoned his entomological interests for a few months to act as Manager of Sunraysia Horticultural Centre. Greg has also had 8 weeks of tripping around Victoria interviewing staff as part of DARA's Annual Scientists Assessment Panel. He reports it is a fascinating exercise to get such a broad view of scientific work in DARA.

Greg, David Madge and Simon Stirrat have been working on integrated pest management for both citrus and grapes. They have been successfully using day-degree models to time sprays for lightbrown apple moth. Pest monitoring services are being sold through "Cropwatch", especially to table grape producers. The IPM work is being developed in conjunction with plant pathologists working on models and monitoring systems for grape diseases.

Keith Turnbull Research Institute (CF&L)

The first release of the European wasp parasitoid, *Sphecophaga vesparum*, was made in early December. This is an Ichneumonid imported from Europe via New Zealand. *S. vesparum* lays it eggs on European wasp pupae and the developing parasitoids feed on the European wasp pupae and kill them. Sue Bardy has been recommended as the scientist in charge of the European wasp biocontrol project.

A mass rearing section of Biological Control of Weeds is being planned, Robin Adair has been recommended as the scientist in charge, leaving the bone seed programme. Keary Winters will be the Technical Officer attached to the project.

John Weiss has been appointed to carry out ecological research on horehound and then the biological control of the weed.

Ross Field has just returned from 3 1/2 months long service leave.

Chisholm Institute of Technology

Ian Campbell spent 3 weeks in November–December collecting mayflies in Queensland — mainly around Townsville and in the Conondale Ranges, and has been working on a literature review for the Department of Water Resources on the potential use of aquatic insects for determining instream flows. The proceedings of the International Mayfly and Stonefly Conference held at Marysville in February, 1987, have (at last) been published by Kluwer under the title "Mayflies and Stoneflies - life histories and biology".

Chisholm staff are spending most of their time (it seems) preparing for the merger with Monash in July this year. The fate of the Chisholm entomologists is unclear as yet — but a new faculty of Aquatic Entomology appears unlikely.

Melbourne University Genetics Department

The peripatetic Charles Webb from the University of Northern Territory managed to touch down in Melbourne for a week despite the uncertainties of the pilots' dispute. He spent the time with Jon Martin looking at the development of the larval head, particularly the ventromental plates, through the four larval instars of *Chironomus*. The first instar was a bit of a surprise and raises some interesting prospects for establishing relationships between genera and the plesiomorphic state of some larval characters.

One which affects a number of Australian entomologists besides Peter Cranston (ANIC, CSIRO, Canberra) and Jon Martin; the "Catalog of the Diptera of the Australasian and Oceanic Regions" is now out. Peter and Jon did the Chironomidae, and it means that at last the Australian species have been put into a modern classification (at least as far as possible) in line with those of Europe and North America. Neal Evenhuis of the Bishop Museum, Hawaii, deserves a word of thanks for his efforts as editor of this volume.

Monash University, Department of Genetics and Developmental Biology

Steve McKechnie's interest in dietary induction metabolic enzymes in larvae of *Drosophila* continues. He and Ary Hoffmann at La Trobe are launching a large project to elucidate the physiological and genetic basis of stress resistance variation. Many insects appear to share common mechanisms of resistance, the same metabolic changes facilitating resistance to a variety of stresses.

Alex Agrotis, in Steve's laboratory, is currently writing up his PhD thesis on population variation in an enzyme gene (DNA haplotypes) of winery *Drosophila*.

La Trobe University, Zoology Department

Dr Alfonso Garcia A., of the National University of Mexico (UNAM), Mexico City, is participating with Ian Thornton, Tim New and Evan Schmidt (and possibly Courtenary Smithers) in a survey of the psocopteran fauna of the SE Australian mountain areas over January and February. He will be based at the Zoology Department at La Trobe.

He will visit Courtenay Smithers in Sydney for about a week before returning to Mexico.

Museum of Victoria: Entomology Department

Ken Walker joined staff from the Museum's Ornithology department on a 5 week field excursion to Western Australia during November 1989. Nicknamed the "Birds and Bees Trip", it proved to be a successful combination as both groups were seeking blossoms. The only trouble was whether a gun or net reached the blossoms first. Collecting in Western Australia with its endemic flora as well as in the dry regions of the Nullarbor and around Norseman provided an excellent contrast to eastern Australian localities.

Arturs Neboiss retired on November 30th 1989 after a 35 year stay with the Entomology department. We wish him all the best with his retirement projects. He was made an Emeritus Curator of the Museum and is continuing his Trichoptera research. With speed that has stunned Museum staff, his vacated position was advertised (although well hidden) on January 13th, but true to form a corrected version had to be readvertised two weeks later.

Museum of Victoria: Invertebrate Survey Department

The report on the conservation values of the Mullum Mullum and Koonung valleys (referred to in the last issue of Myrmecia) has been produced. The report stresses that the study area is of significance for invertebrates on the basis that the habitat involved has been greatly depleted by urban expansion and, given the diversity and patchiness of distribution of invertebrates, is likely to contain significant species and communities. Alan Yen is representing invertebrates at the hearings which will decide if the proposed arterial road will go ahead.

Pat Vaughan has commenced a year-long study of the aquatic invertebrates of the swamps on the basalt plains west

of Melbourne. The study is funded by the Department of Conservation, Forests and Lands (CF&L) as part of broader research on Victoria's wetlands, which have been identified as being under considerable threat. Research on the invertebrates will be correlated with concurrent studies by CF&L of the flora and vertebrate fauna. Pat is currently receiving assistance from Peter Lilywhite and from temporary employee Martin Read who successfully completed Honours at La Trobe University last year. Pat would be pleased to receive any information relevant to the swamps.

A survey of the invertebrates of the Derrimut grasslands is being continued by Alan Yen and Peter Lilywhite. It is hoped that further funding for grassland conservation research will be forthcoming, as the government has recognised that grasslands are threatened habitats in the state. Grasslands have been reduced to less than 5% of their original cover and the remaining isolated remnants are faced with continuing degradation.

Monash University: Department of Botany and Zoology

Brian Roberts is still working on flies and hormones, and has been seconded to teach in Indonesia for IDP during October-December. Kathy LeFevere has an appointment as post doctoral fellow and is researching aspects of juvenile hormone in sheep blowflies. Mark Collier has been awarded a Wool Board scholarship for his PhD for research on reproductive hormones in *Lucilia cuprina*. Edi Basuki is an IDP Fellowship holder from Indonesia and is researching hormonal development control of *Lucilia cuprina*. Fiona Clissold is proceeding with an MSc degree on reproductive hormones in *Lucilia cuprina*. Sarita Kulkarni is analysing the development of *Epiphyas posvittana* with special emphasis on thermoperiod and photoperiodic effects on hormonal release.

JANET HORNE
AND PAT VAUGHAN
Regional Councillors

TASMANIA

Department of Primary Industry

Andrew and Sharon Rath were blessed with a second child, Nathan born two days before Christmas. Andrew reports good results with direct drilled applications of the fungus *Metarhizium* during autumn pasture establishment for control of red headed pasture cockchafer. He is now looking to maintaining high mortality levels over several seasons so as to prevent pasture damage. Paul Wright is a new member of the Society based at the Newtown laboratories. Paul is working with Vin Patel, formerly of the CSIRO nematode unit on using the new endemic fungal genus *Microhilum* for control of corbie (*Oncopera*) caterpillars in pasture. He is funded by the Australian Meat and Livestock Corporation. This project involves assessing natural levels of control from *Microhilum*, screening for cold active strains and testing various formulations for field application. Aleks Terauds has been promoted to a position as agricultural chemicals co-ordinator. His previous position as Principal Entomologist will remain vacant while the Department assesses a reorganisation of the entomology, plant pathology and weeds sections. Lionel Hill will be attending the Oilseeds Research Council national Workshop on *Heliothis* in Brisbane 3–4 February 1990.

LIONEL HILL
Regional Councillor

WESTERN AUSTRALIA

News was difficult to collect for this period with a large proportion of Entomologists either behaving very cryptically or entering diapause. Nevertheless, an intensive sampling programme did uncover some from which the following news was extracted.

Agriculture Protection Board

Restoration of the historical port town of Cossack, near Karratha in WA's north-west, ran into difficulties in the form of *Mastotermes darwiniensis*. The town had previously reached an advanced state of disrepair but efforts had been made to restore it in its original style. Aged jarrah, salvaged from the wool stores demolished at Fremantle, was used to retain the authenticity of the buildings. Unfortunately the giant termite

accepted this as an invitation to a smorgasbord and inflicted serious damage in a short space of time.

Peter Davis was requested to visit the area and make recommendations.

The building engineers had already decided to use non-edible material in areas out of view e.g. roof voids, and steel trusses were sensibly being used.

Besides recommendations for use of non-susceptible materials, where possible, and installation of chemical barriers, use of susceptible timber billets, for detection of giant termite activity and Mirex baits on such activity was seen as a useful adjunct. Although time was limited, an inspection of the surrounding bush area suggested that giant termite activity might be quite localised in and about the townsite. Use of the Mirex baits should significantly reduce the pressure on the chemical barriers and may even remove the giant termite from the area if the population is in fact localised.

John van Schagen and Marc Widmer are continuing their studies on the effects of Argentine ants on native ant species in various eco- systems. The study is planned to run a complete year and involves pitfall trapping, hand collection and bait trapping at night and day times and will cover the four seasons.

Curtin University of Technology

Jonathan Majer has just returned from Outside Studies Program in Brazil. Whilst there he participated in three projects: the composition of ant communities in Atlantic rainforests; ant succession in rehabilitated bauxite mines; and the distribution of ants in the canopies of Bahian cocoa trees. His rested state was rapidly ended when he returned to find his laboratory full of unsorted material which had been collected in his absence.

Stuart Little has recently completed his Honours thesis entitled "A study of soil and litter invertebrates in semi-arid kwongan vegetation, with special reference to fire age". Mr Hyean Cheal Park has recently arrived from Dong-A University of Korea to undertake a higher degree study at Curtin. Park will be looking at the role of termites (*Drepanotermes*) in nutrient cycling in a wheatbelt nature reserve.

Harry Recher (University of New England) and Jonathan Majer have received a grant from the ARC to look at the taxonomic composition of arthropods in Eucalyptus canopies. Tony Postle will shortly take up the position as research associate with this project.

Department of Agriculture

In recent times the Entomology Branch has taken on a similar function to the transit lounge at an airport. Staff project changes have been unusually high. The previous emigration of Anne Hill and John Sandow have been added to by Peter McFadden who has resigned as Kununurra's resident entomologist to take on a Pest Control business in Kununurra. Peter is probably already well on the way to his first $million with a captive audience infested with American cockroaches, Singapore ants and giant termites. We wish Peter all the best. We expect that, being the innovative and enthusiastic person he is, Peter and the Entomology Branch will stay in contact and that he may play some part in experimental programmes in the north. Peter is already testing an ant bait against Singapore ants in Derby.

Also leaving, albeit temporarily, is David Cook who is off to Canberra at the end of February to take up the first year of a CSIRO Post Doctoral Award he was recently successful in obtaining. David will be working on the field mating system of the Australian sheep blowfly, *Lucilia cuprina*, in particular identifying which individuals, of the male population, are securing the most matings. This work should ultimately benefit CSIRO's genetic control program against *L. cuprina* which is currently being run on Flinders Island in Bass Strait. David will undertake the second year of the award back within WADA at Perth.

Rob Emery is continuing his studies into cockchafer damage to cereals, lupins and pasture. Last year damage was estimated to be in the vicinity of $500,000. At Narrogin light trap catches of this pest, which belongs to the genus *Heteronyx*, have numbered 28,000/night. Rob's technical help has changed, however, as Justin McKirdy left to join a hockey team touring Europe. In his place is a newcomer in Andreas Szito. Andreas is from Hungary and has a degree from the University of Agricultural Science in Godollo. He has previously worked on cockchafers and has also been a Manager of Agrochemical Use for Hoechst in Hungary.

A collaborative programme with CSIRO on bush fly control using dung beetles has seen the appointment of Ian Dadour and Technical Officer John Allen. Ian completed his PhD at UWA Zoology on bushcrickets and spent a year postdoc in West Germany working on population dynamics and acoustics of bushcrickets. Following this he completed 15 months postdoc at Waite Agricultural Research Institute in SA studying the population genetics of cabbage white butterflies

and two of their hymenopterous parasites. He is shortly returning to Adelaide for 10 weeks to complete this project.

Stewart Learmonth has recently received his MSc for his (marathon) work on the ecology of *Heliothis punctigera* undertaken at the Waite Institute in South Australia. Congratulations Stewart.

Tony Postle has recently been to the Argyle Diamond Mine site collecting and identifying insects from rehabilitation areas.

Department of Conservation and Land Management

Ian Abbott and crew have been investigating the effect of 'forest burns' on the jarrah leaf miner populations. Data from a spring burning experiment has been analysed and little measurable effect was observed. Results from an autumn burn have yet to be analysed.

Janet Farr has been monitoring gumleaf skeletonizer (GLS), *Uraba lugens*, populations using a cherry-picker. The front, along which GLS was active, was monitored via binoculars. Since 1986 the GLS population has crashed. It appears natural factors, which included parasitic wasps of the genus *Euplectrus* and a pathogen (probably viral) accounted for >90% of the mortality of larvae.

A proposal to the Federal Government was instigated in collaboration with WADA and the District Soil Conservation Committee of Jerramungup as part of the "Save the Bush Programme". The proposal centres on farm management practices which affect the lerp, *Cardiospina brunnea*.

Janet also announces that the insectary at Manjimup has been completed, finally, which introduces the next difficult stage; that of furnishing it.

Paul van Heurck has just about completed his thesis for the Post-graduate Diploma on the parasites, predators and pathogens of *Uraba lugens*. A pathogen, probably a nucleopolyhedrosis virus (NPV) was collected and may be a new find for Australia.

CSIRO

On December 21, the Premier of WA, the Hon Peter Dowding, launched a new popular book on bush flies, called "The Fly in Your Eye" which tells you everything you wanted to know about these pests but were too afraid, or embarrassed, to ask. It is based in particular on over 20 years CSIRO research. The Premier is interested as he has supported a new dung beetle programme, based in the West, aimed to further reduce bush fly populations by introducing "spring active" beetles from Spain. This programme has started in top gear with the appointment of Dr Ian Dadour and Mr John Allen to the Entomology Branch of the WA Department of Agriculture. They are carrying out some 'before' studies on bush flies prior to the release of the new beetles. Beetle abundance has been most spectacular this year with dung pads being destroyed in only a few hours. The launch of the book was a great success and they are selling fast. They may be obtained directly from J and E Publishing, PO Box 7317, Cloisters Square, Perth WA 6000 for $8.50 (which includes postage and handling).

Health Department

The WA government has established a "Mosquito Control Task Force", the purpose of which is to "provide a strategy for control of Ross River virus vector mosquitoes breeding in wetland areas ... as a general ongoing policy". Tony Wright has been kept busy as executive secretary of the Task Force, which meets fortnightly and has a deadline of the end of February 1990 to present recommendations to State Cabinet.

WA Museum

Both Terry Houston and Mark Harvey have been away on a field trip to the Warburton ranges.

Visitors

During November Entomologists at the Department of Agriculture had the pleasure of a 2 week visit by Dr Victor Eastop, retired (but still very active), aphid taxonomist from the British Museum. Vic found time to examine collections of aphid material held by the Department. He was also able to join field trips made by the WADA aphid group to the south-west of the state, looking in particular for elusive native aphids. We look forward to using the updated keys to Australian aphids that should result from this trip.

Neil Gough from DPI Queensland visited Bill Woods to spend some time looking for natural enemies of insects attacking Geraldton Wax. Geraldton Wax being grown for the floriculture industry in Queensland is suffering from insect damage. While in Perth he also visited CSIRO and talked with John Matthiessen about white fringed weevils.

Dr Stephen Buchmann, from the USDA Agriculture Research Service Tucson, Arizona took a flying visit to areas south and east of Perth. However he found enough time to give an interesting seminar titled "Assessing what honeybees

eat: Implications for competition with native bees and birds" on December 20.

Not only did the seminar prove interesting but it served to forge some valuable contacts as some parallel studies have been undertaken in the USA and WA.

The following day Stephen visited Dr Terry Houston at the WA Museum.

What is an entomologist?

As part of the grain weevil insecticide resistance survey, Rob Emery gets a lot of samples from all over the state. The mis- spellings of entomology on the addressed samples have intrigued him so he's kept a list. These are the variations (genuine) logged to date: antamology, antimology, antomology, emptimology, emptomology, endomology, entamology, entemology, entimology, entomerlogy, entomoligy, entomoly, entymology, intomology

Its no wonder a lot of people don't know what us emptimerlogists do as they can never find out even if they bothered to look at a dictionary.

In the Argentine Ant Section we had a letter addressed to the Emmetology Branch but, as an emmet is an ant, we're not quite sure if it was a genuine (and lucky) mistake and qualifies to be added to the above list, or some knowledgeable wag showing off.

PETER DAVIS
Regional Councillor

Overseas News

NEW ZEALAND

Olwyn Green, a MAF entomologist and volunteer helper at the Commonwealth Games discovered some strange looking ants running over her violin case during the final dress rehearsal. Subsequent identification indicated the presence of *Iridomyrmex humilis*, the Argentine Ant, which many Australians would describe as "that's what you'd call a real B..."

A quick survey showed the ants to be well established in the stadium, in their typical high numbers and enjoying their characteristic monopoly on empty soft drink cans and other sweet fodder. MAF decided to keep it under their hat so as not to cause a panic and on Wednesday, 24th January, 30,000 spectators sat there, mesmerized, watching the impressive opening ceremony, unaware of the fact they had ants in their pants.

An unnamed Australian entomologist, contacted by MAF, told them the most common means of transportation of these ants is via jock-straps....(reported by Ruud Kleinpaste, MAF Auckland).

JOHN TENQUIST
New Zealand Correspondent

The 1990 Annual Conference of the Entomological Society of New Zealand will be held at Lincoln University, Canterbury, South Island on May 6-9, 1990. This conference is being specially promoted because it is marked by three auspicious occasions - the 21st birthday of New Zealand's only Department of Entomology, Lincoln's promotion to University status, and the 150th anniversary of the signing of the Treaty of Waitangi.

As well as general submitted papers there will be two symposia.

1. Conservation — including a look at species interactions, surveillance and monitoring of indigenous and exotic species, and new legislation affecting parks and reserves.
2. Applied Entomology towards the Year 2000 - the keynote speaker is Dr Marjorie Hoy from California.

For more information, contact,
Dr R.R. Scott
Entomology Department, Lincoln University
Private Bag
Canterbury NEW ZEALAND

News from Affiliated Societies

ENTOMOLOGICAL SOCIETY OF QUEENSLAND

On 24-26 November several Society members and friends attended a camping/talking/lazing weekend at Mount Tully, SE of Stanthorpe, with Gudrun Sarnes and Ann Tanner as our hosts. With cool nights, collecting at the light sheet was poor but this was compensated for by the pleasant daylight hours, enabling extended walks and profitable collecting. Visitors on the Saturday included Jean Harslett (Amiens), Frank Page and family (Applethorpe) and Joe and Maria Sedlacek (Brisbane/Stanthorpe).

The year ended with a well attended barbeque at the Alan Fletcher Research Station at Sherwood, in December, followed by an always popular Notes and Exhibits meeting. The topics and displays ranged from computer generated distribution maps to biological control.

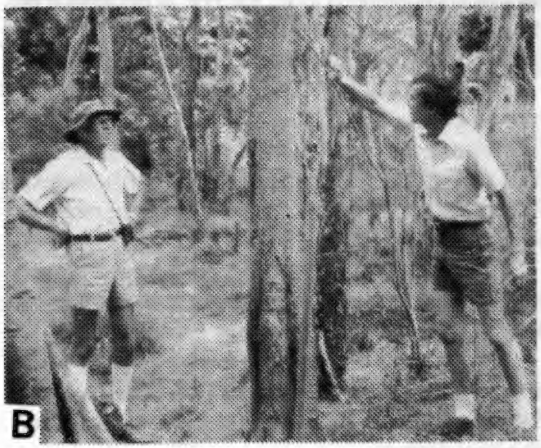
The next meeting of the Society will be the AGM to be held at the University of Queensland on 12th March, at 8.00 pm in room 323 of the Hartley Teakle Building. Annual Reports for 1989 will be presented and the Council for 1990 elected. The main business will be the Presidential Address of the retiring President Neil Gough.

GREG DANIELS
Representative Councillor

ENTOMOLOGICAL SOCIETY OF NEW SOUTH WALES

The Society calendar for '89 closed with a flurry of activity. The final meeting in October comprised a most interesting address by Ting Kui Qin on the taxonomy of cottony soft scales (Scales in the genus *Pulvinaria*). Ting Kui has studied these insects over the past few years to qualify for a MSc at the Australian National University, and his talk demonstrated the difficulties in working with this group.

The major activity for the month of November was, of course, the Insect Sciences Crisis meeting, held 27–28th November at Macquarie University. The meeting was well



The Christmas excursion of Ent.Soc.NSW. (A) Stewart and Graham Brown, Mary Ann Terras and Courtenay Smithers "Surrounding their prey" (B) George Divine and Max Moulds "Here's another little beauty!"

attended by local and interstate representatives from all areas of entomological employment. The presentations were extremely thought provoking, and a mixture of opinions and ideas were expressed on the future requirements in both entomological education and employment. A number of proposals for dealing with problems in entomological education in Sydney resulted from the meeting, and a committee was formed to prepare a submission based on these proposals to go to educational authorities.

Finally, the year closed with the combined Christmas function/Young Entomologist's Collecting day. The function was held at the Field of Mars Reserve at Ryde, which is an urban nature reserve in the northern suburbs of Sydney, with collecting revolving around a lunchtime barbeque. The weather was good and all in attendance had a good feed and a great time. Insect collecting, however, was better for some than others (Max Moulds taking a "bag" of about 30 cicadas). Everyone displayed their catches at the end of the day and it proved most informative for the participating young entomologists.

JOHN MACDONALD
Representative Councillor

ENTOMOLOGICAL SOCIETY OF VICTORIA

Highlights over the past few months include the retiring Presidential address by Ken Walker to the Annual General Meeting of the Society in June. The topic for the address was 'Insect Body Language", and included visual aids and descriptions of grooming behaviour of the Hymenoptera.

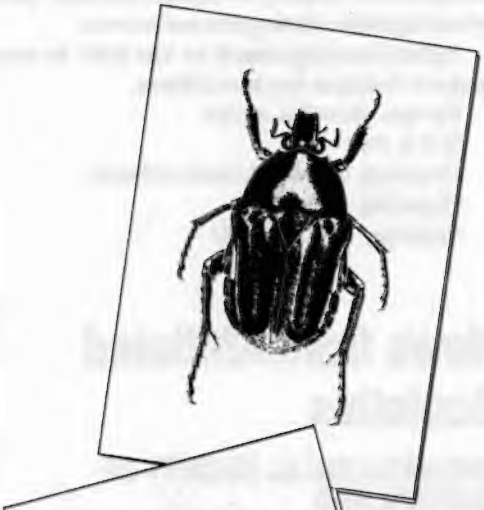
The August meeting of the Society included short talks by members, where talks included: - early stages and larval breeding of moths, together with photographic displays by Mike and Pat Coupar — records of butterflies in the Melbourne metropolitan area by John Burns — the expanding range of the European wasp by Ross Field.

A field excursion was planned in late October to "Greens Bush" — an area of wetland and heathland approximately 60 km from Melbourne on the Mornington Peninsula.

The December meeting was a members night for exhibits and slides which were followed by light refreshments. Messrs Kelvyn Dunn and Ian Faithfull were co-opted onto Council to fill current vacancies.

MARK HUNTING
Representative Councillor

SOCIETY LETTERCARDS FOR SALE



The Society has produced two, quality lettercards based on prize-winning drawings from the annual illustration competition. They are obtainable from the Business Manager: ten for $4.00 or two for $1.00.
Postage for ten is $0.95 within Qld and $1.05 for other states.
Postage for two is $0.37.

AUSTRALIAN BIOLOGICAL RESOURCES STUDY

ABRS has announced its funding grants for the 1990 year. The lucky recipients for entomological projects are as follows:

AUSTRALIAN CAPITAL TERRITORY

CSIRO Division of Entomology
Cranston, Dr P.S. Illustration of keys to larval Chironomidae (Diptera). $21000.
Horak, Dr M. Genus level review of the Australian Phycitinae (Lepidopera: Pyralidae). $25857.
Lawrence, Dr J.F. Taxonomic studies on the genus *Myrmecia* (Hymenoptera: Formicidae: Myrmeciinae). $45600.
Taylor, Mr K.L. Taxonomy and biology (particularly host associations) of Psyllidae on *Eucalyptus* and other Myrtaceae. $700.

Unattached
Cassis, Dr G. Taxonomic revision of the earwigs (Insects: Dermaptera) of Australia. $32580.
Greenslade, Ms P. A taxonomic study of Australian Collembola genera. $35000.
Reid, Mr C.A.M. Taxonomic revision of Australian genera of Eumolpinae (Coleoptera: Chrysomelidae). $34191.

NEW SOUTH WALES

Australian Museum
Bickel, Dr D.J. Revision of the Australian Sympycninae (Diptera: Orthorrhapha: Dolichopodidae). $39040.
Hunt, Dr G.S. Australian Triaenonychidae and Megalopsalidae (Arachnida, Opiliones). $7050.

VICTORIA

University of Melbourne
Black, Mr D.G. Taxonomic studies of Australian Diplopoda. $4446.

QUEENSLAND

University of Queensland
Barker, Dr S.C. Taxonomy of the Boopiidae (Phthiraptera): a review of genera and the *Heterodoxus octoseriatus* group. $8000.

SOUTH AUSTRALIA

CSIRO Division of Soils
Greenslade, Dr P.J.M. Taxonomy of the ant genus *Iridomyrmex* (Dolichoderinae). $40284.

South Australian Museum
Hirst, Mr D.B. Revision of Australian Sparassidae (Araneae) excluding Heteropoda. $18028.

University of Adelaide
Austin, Dr A.D. Taxonomic studies on Australian Braconidae (Hymenoptera: Parasitica). $16760.

Unattached
Southcott, Dr R.V. Taxonomy of parasitic mites (Acarina) and taxonomy of scorpions. $550.

WESTERN AUSTRALIA

Western Australian Museum
Harvey, Dr M.S. The systematics of the Australian Oonopidae (Araneae). $7650.

QUEENSLAND FRUIT FLY ERADICATION CAMPAIGN IN PERTH

By **David Yeates**,
Entomology Branch,
Western Australian Department of Agriculture

The Western Australian Department of Agriculture (WADA) has begun an extensive eradication campaign against the Queensland fruit fly, *Bactrocera tryoni*, described as the most destructive insect pest of fruit and vegetables in Australia (Drew 1982). Queensland fruit fly (Qfly) was first discovered in Perth in February 1989 when a householder rang WADA concerned about maggots in a backyard tomato crop.

The Mediterranean fruit fly (Medfly), *Ceratitis capitata*, has been present in Western Australia since late last century. It can cause severe damage in fruit orchards unless chemical controls are applied. Entomologists were not sure how Qfly, a native of the eastern seaboard rainforests, would spread and reproduce in Perth's mediterranean climate. Summers in Perth are characteristically hot and dry, with an average rainfall total of 34 mm, compared to rainfall in the Brisbane summer months of 520 mm. Meats (1981) predicted that Qfly could pass through 3.5 generations per year in Perth and 3 generations per season would result in numbers large enough to cause significant economic damage. How would the new invader interact with the entrenched population of Medfly? Would Qfly replace Medfly as had been reported around Sydney early this century (Allman 1939)? In any case, the presence of Qfly in Western Australia was a serious breach of quarantine and the horticultural industry estimated that Qfly could cost growers up to $2.0 million per year.

Intensive cuelure trapping began in suburban Perth in March as soon as Qfly was positively identified by Dick Drew at the Queensland Department of Primary Industries in Brisbane. Autumn trapping revealed that the fly was spread over about 100 km² of suburban Perth (Fig. 1).

THE TASK

In July, Alan Bateman, formerly of CSIRO at Warawee in New South Wales and an expert in fruit fly eradication, was called in as a consultant to advise on future strategies for the Perth outbreak. He felt that, although difficult, eradication was possible and must begin in the following spring. He proposed a three pronged attack (Bateman 1989a):

1. The placement of small canelte blocks impregnated with cuelure and malathion in each fruit tree in the infested area beginning in mid August. These blocks would kill overwintering males before they could mate.
2. Application of 100 mL squirts of a protein-malathion bait weekly in all fruiting trees in the infested area beginning in mid September. The baiting would reduce the Qfly population to a low level prior to the release of sterile Qflies (see below).
3. Release of large numbers of sterile Qflies into the infested area as soon as possible. The sterile male flies would mate with wild females causing the population to crash.

Alan also recommended an intensive detection system of cuelure traps and fruit sampling to monitor the progress of the eradication.

The budget for the eradication was $5.0 million. Clearly, the horticultural industry could not fund the operation so WADA had to seek the funds from the State government. In addition to the cost, the eradication would be an immense practical and logistic exercise that would employ hundreds of temporary staff and call for the purchase of mountains of equipment. Furthermore, it had to begin one month from the

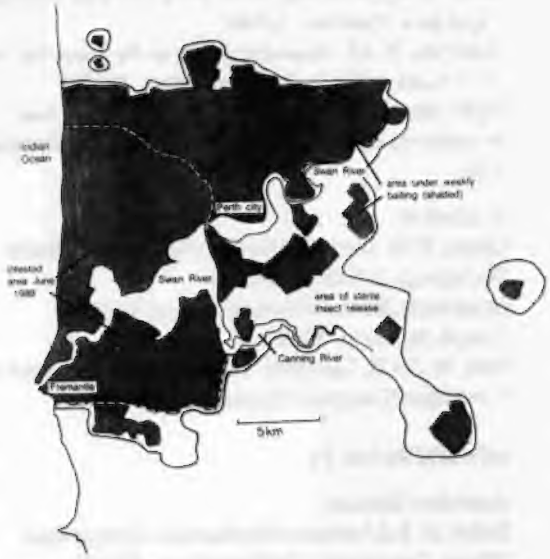


Fig. 1. Map of Perth showing; (1) 100 km² area infested with the Qfly at the time of Bateman's (1989a) original report (shaded and surrounded by broken line); (2) 250 km² area now known to be infested and receiving weekly applications of bait (shaded); (3) 318 km² area of sterile male release (heavy line).

time of Bateman's report for the greatest chance of success.

The WADA Entomology Branch waited impatiently in August for the cabinet decision on the funding of the eradication programme. In case the government agreed to funding, any obstacles to the speedy implementation of the campaign were removed. Before any lure blocks or baits could be applied to Perth fruit trees, WADA was required to submit a report to another government body, the Environmental Protection Authority (EPA), outlining the strategy of the proposed eradication programme and detailing the chemicals used and their method of application. The EPA examined the report, called for public comment and assessed the impact of the programme on public health and the environment. All this took about 2 weeks with the EPA giving its approval on the 25th of August.

Finally, after much lobbying from the industry and the Minister for Agriculture, Ernie Bridge, funding was approved on September 4. A Steering Committee was formed in the WADA to coordinate the finance and activities of the eradication programme. It consisted of Dr Nic Monzu (Chief Entomologist), Dr Brian Stynes (Director of Horticulture) and Dr Neil Hogstrom (Chief, Agriculture Protection Board). The Entomology Branch had one ace up its sleeves because its officers had considerable experience in the use of sterile insect release methods, eradicating Medfly from Carnarvon in 1984 (Fisher, Hill and Sproul 1985). The irradiator used in the Carnarvon campaign was still serviceable, however a new building was required to rear the 30 million sterile Qflies required weekly.

John Bradshaw, a recently retired senior quarantine inspector with a lifetime of experience in Medfly baiting programmes, was brought back to coordinate the operational side of the programme i.e. distribution of lure blocks, protein-malathion bait and finally sterile Qflies. Ironically John was the quarantine inspector who responded to the householder's query in February that led to the discovery of Qflies. Most of the field supervisors were chosen from the Agriculture Protection Board's Argentine ant eradication team. Kingsley Fisher, Entomologist with WADA and leader of the Carnarvon Medfly eradication, was made responsible for production of the 30 million sterile Qflies required each week in the final phase of the programme. Andy Sproul was coaxed out of retirement to supervise the fruit monitoring and I was responsible for monitoring the programme with pheromone traps.

At the time of writing this report the eradiation program has been running for 5 months and the various components have developed along the lines originally envisaged and detailed below. Bateman (1989b) reviewed the programme in December.

PROGRESS TO DATE

A. Trap Monitoring

Fifteen technical officers are employed installing and servicing a total of over 1200 cuelure traps set on a 1 km grid throughout Perth and in surrounding country towns (Fig. 2). In addition, each town in the south west of the State is monitored with traps serviced by WADA staff or Agriculture Protection Board officers. Since spring these traps have detected Qfly populations over an additional 150 km^2, more than doubling the size of the infested area known at the beginning of the programme (Fig. 1). The population of wild Qflies in Perth is still very low as a total of only 232 males have been collected in all traps during the three months to January 15. A single male fly in a pheromone trap outside the known infested area does not indicate a breeding population in itself, but may be an "itinerant" male in its dispersal phase. When a single male is collected outside the infested area, a nest of 10-15 additional traps are placed within a 500 m radius. Protein-malathion baiting treatments are initiated if additional flies are collected in these supplementary traps within 2 weeks after baiting begins.

B. Fruit Monitoring

Andy Sproul has an efficient team of 18 technical officers collecting fruit samples and identifying the immature fruit flies in them. This sampling aims to gauge the reduction in Qfly larvae in fruit in the infested area and acts as an adjunct to the traps in locating breeding populations. Their task is made difficult because most fruit in Perth is infested with Medfly. The larvae and pupae of Qfly and Medfly are difficult to distinguish although adults are distinctively different. Tony Postle has developed techniques to screen large numbers of larvae and pupae and accurately discriminate between the two species. To date over 2,500 fruit samples have been collected and over 110,000 immature fruit flies have been identified. In September and October 6% of the 549 samples collected were infested with Qfly. In contrast, since the beginning of November only 1.3% of more than 2000 samples collected have been infested. This reduction in Qfly infestation can be attributed to the baiting component of the programme. As a result of the baiting, Medfly numbers have also declined dramatically and many Perth residents have been able to grow maggot free fruit for the first time.

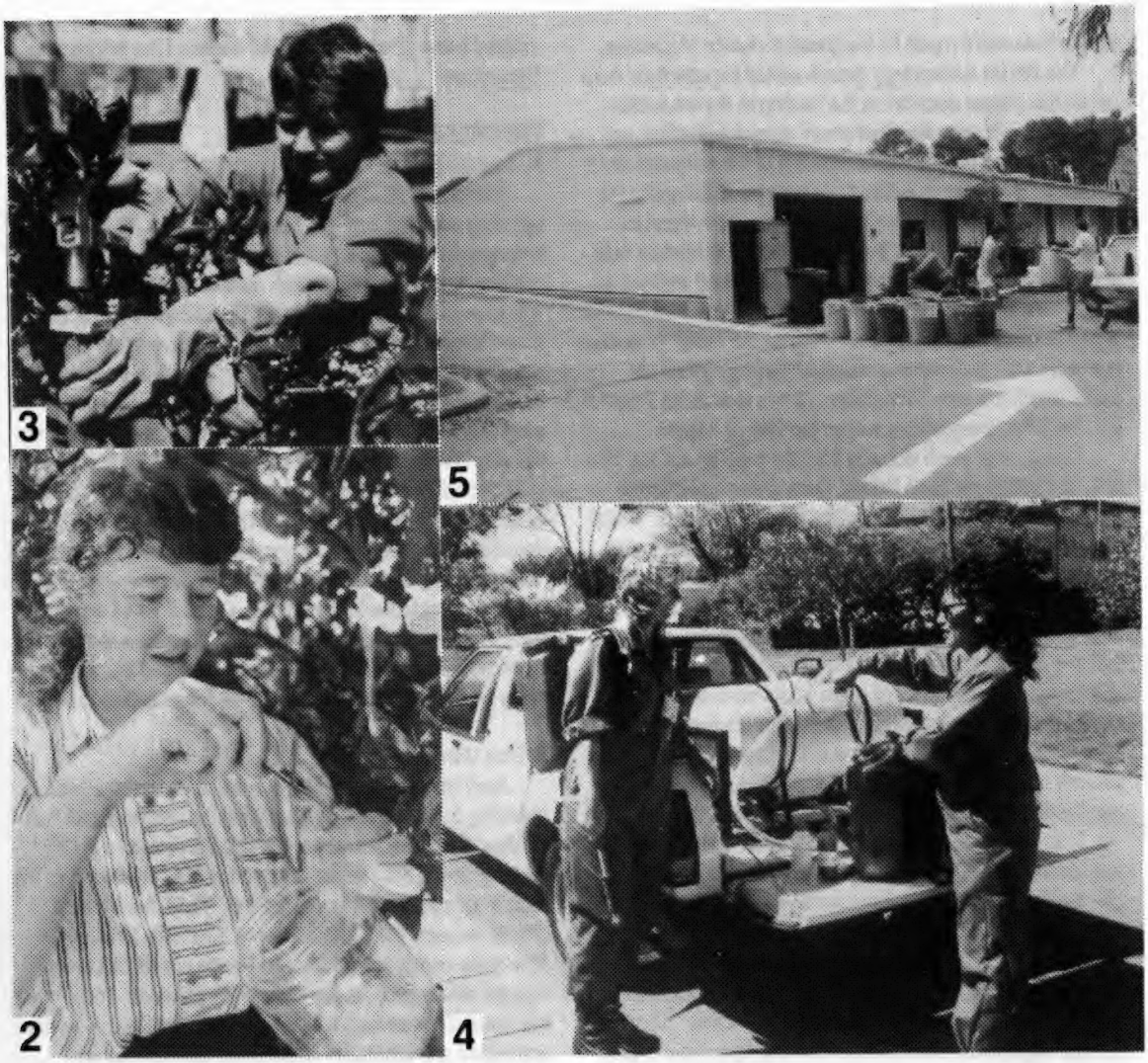


Fig. 2. Sterile Queensland fruit flies being removed from a cuelure trap by a trap monitoring officer.
Fig. 3. A caneite block impregnated with cuelure and malathion being nailed amongst small citrus trees by a member of the blocking team.
Fig. 4. Two members of a baiting team returning to the vehicle to refill their knapsacks.
Fig. 5. Larval medium being mixed outside the $0.5 million Queensland fruit fly breeding building.

C. Lure Blocking

The programme was given the green light too late to nail all 250,000 lure blocks onto fruit trees throughout the infested area in August. Only hotspots (defined as areas where more than 5 flies were collected in the autumn trapping) were treated with lure blocks in September and October before labour was diverted to baiting. In addition, blocks were distributed as new infestations were discovered in November and by the end of that month a total of 90,000 blocks had been distributed over an area of 85 km^2 (Fig. 3). Chemical analysis indicated that the blocks had only lost about 20% of their potency after 4 months in the field, thus they should kill significant numbers of the sterile Qflies. No further blocks were distributed and in January teams were sent to remove as many blocks as possible from the field.

D. Bait Applications

The delivery of bait to every fruiting tree in the infested area presents by far the greatest test of the eradication team's organisation. At present 324 staff are employed using 125 vehicles. Teams of three baiters in a utility truck apply baits to an average of 300 properties per day using knapsack spray units (Fig. 4). The distinctive blue overalls worn by the baiters have become a familiar sight to Perth residents this summer. An average of 45,500 litres of bait was applied to trees in 140,000 properties each week in December and to the end of December 620,000 litres of bait had been applied over the total infested area of 250 km^2. Coupled with the tasks of staff management and on the spot strategic planning, John Bradshaw has borne the brunt of a vocal pesticide lobby group that has protested against the programme in newspapers right from the outset.

The organisation of the baiting teams is now so efficient that once a population of Qfly is detected leaflets can be distributed to each household in the area and bait can then be applied to properties within 24-48 hrs.

E. Sterile Insect Release

Kingsley Fisher designed the $0.5 million dollar rearing facility that was built in three months to breed the 30 million flies per week required in the final phase of the eradication programme (Fig. 5). The starter batch of 50,000 pupae was flown from the colony at the Queensland Department of Primary Industries, Brisbane, in September and held in a quarantine facility until the new building was commissioned on December 1. Kingsley's staff of 22 rapidly increased the colony size which now consumes about 4 tons of larval medium per week. The first batch of sterile Qflies were released on January 3 and distribution teams are gearing up for the expected production of 20 million sterile flies each week in January. The flies are irradiated under nitrogen with a 19.8 kRad dose of gamma radiation from a Gammacel 220 irradiator. The Gammacel was loaded with its cobalt 60 source in 1978 and now radiates only one fifth of its original output per hour.

The sterile insect release method has rarely been used on Qfly (Andrewartha, Monro and Richardson 1967). In Perth, sterile Qflies will be distributed over an area slightly larger than the area known to be infested to allow for wandering wild females (Fig. 1). The cuelure-malathion blocks are removed and the protein-malathion baiting is curtailed one week before the first release in any area. By mid January sterile Qflies had been released at points 500-1000 m apart over about one third of the infested area, encompassing suburbs between the arms of the Swan and Canning Rivers.

The sterile male flies are attracted to the cuelure traps just as the wild flies are and a laboratory has been adapted to sort out the steriles. The sterile Qflies are marked with a fluorescent dye on emergence from the puparium and under ultraviolet light particles of the dye can be seen on the invaginated ptilinum inside the head. Overflooding ratios in excess of 50 sterile males to 1 fertile male have been recorded in successful eradication campaigns against the melon fly (Steiner *et al.* 1965), a related species that is also attracted to cuelure. The Perth eradication campaign is aiming at overflooding ratios greater than 100:1. Preliminary results indicate that some sterile males have flown at least 3 km before entering cuelure traps. Experiments aimed at quantifying the longevity and dispersal of the sterile flies are underway using flies marked with a second fluorescent dye colour.

COUP DE GRACE

Between January and April the sterile releases will be made over larger areas and the protein-malathion baiting will be gradually phased out. These sterile flies are intended to mate with all newly emerged wild females leading them to produce infertile progeny. The Qfly overwinters as an adult however during this time males show a greatly reduced response to cuelure. Eradication is predicted by June 1990 however overall success will not be certain until spring 1990

when overwintering flies begin to enter traps. The sterile insects and some baiting teams will be kept on alert until the all clear is given. Eradication will be declared when no wild Qflies have been found for a period of 2 Qfly generations.

Western Australia will guard against future invasion with a Qfly detection system of cuelure traps throughout Perth and larger country towns similar to that now implemented in South Australia.

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Book Reviews

A revision of the Indo-Australian Genus *Attacus*. By Richard S. Peigler, I-XI + 167 pages (incl. 4 coloured plates), paperback, 20x28 cm. Price US $30.00 including packing and surface postage to Australia. Published by The Lepidoptera Research Foundation, California and available from the publisher at 9620 Heather Road, Beverley Hills, California, 90210 USA.

The genus *Attacus* or atlas moths (Saturniidae) are one of the most popular groups among silk-moth rearers the world over. This book deals in detail with the fourteen species Peigler recognises. Curiously, while a massive amount of information is available on the atlas moth, *Attacus atlas* (L.), some of the other species are extremely poorly known. *Attacus wardi* Rothschild, the Australian species, falls into this category.

This book is a very detailed and thorough summary of knowledge about the genus. It originated as a PhD thesis and has been updated and adapted into a well-put-together book. It includes a detailed and informative literature review; chapters on methods, morphology of all stages, a description of the genus, a key to adults and a species by species account which includes *Attacus fossilis* Cockerell, a "species" Peiger suspects is part of a fossil leaf. Following this is an extensive treatment of biology and ecology, a cladistic analysis of the generic relationships within the Attacini and a discussion on zoogeography and phylogeny. There are appendices listing host plants and the modern equivalents of many old names found on labels. All species are illustrated with ink drawings of the genitalia and four good colour plates of adults are included.

Dealing with such a popular group introduces its own problems, in particular problems with the status of recorded host plants (i.e. are they natural hosts or were captive larvae fed on them?) and of mislabelling. Peigler has handled both of these problems well. Often, for example with *A. lorquini* C. and R. Felder and *A. aurantiacus* Rothschild, he discusses the possibility of mislabelling carefully. Most Australians would be cautious about the two records of *A. wardi* from Cape York, otherwise known only from near Darwin, although such a distribution is not without precedent. Nevertheless Peigler was entirely correct to mention these specimens so that readers with more familiarity with the geography can draw their own conclusions. His comment that *Coscinocera hercules* (Miskin) occurs at Darwin deserves more scepticism.

Although unable to visit the places where *Attacus* occurs, the author has reared a number of species from eggs and has made the best possible use of literature. He has examined many hundreds of specimens in North American and European museums and taken the study as far as possible without seeing the genus in its native habitat.

Few scientific authors buy into controversy but Peigler, responding to the inevitable question and the *Guiness Book of Records* notwithstanding, decides that in his experience the female of *Attacus caesar* Maassen from the Philippines is the largest moth in the world based on average wing area. No one has tried feeding them steroids yet!

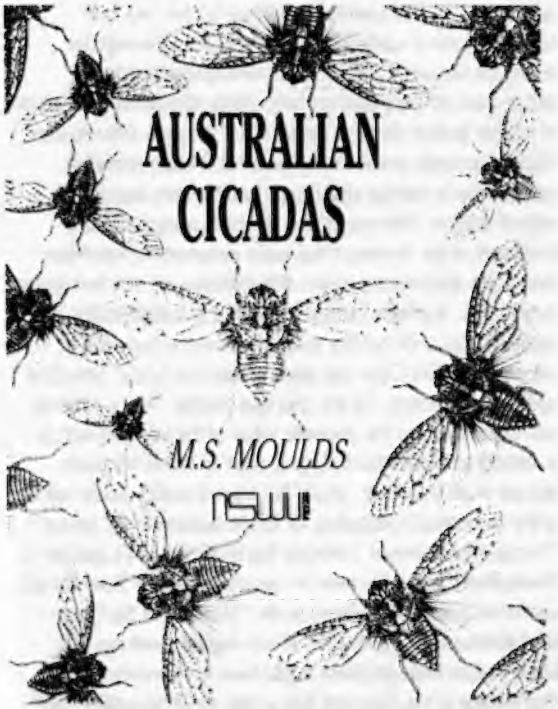
Scale bars would have been useful on the colour plates but sizes are given in detail in the text. The author has had difficulties with genitalic studies, for example all known females of *A. wardi* have been eviscerated and critical parts destroyed. Even so the drawings of male and female genitalia are unnecessarily crude and could have been much more helpful.

The book is essential for all in the wide fraternity of silkmoth rearers throughout the world. It is equally essential to the serious Lepidopterist as a useful and detailed treatment of one of the most popular genera. At US $30.00 it is good value.

E.D. EDWARDS
CSIRO Division of Entomology

Australian Cicadas By M.S.Moulds (1990) 217 pp, 22 b/w figs, 24 col. plates. New South Wales University Press, Kensington, NSW. Price $39.95.

Well it's here at last! Though titled "Australian Cicadas" I'm sure we'll all soon come to know it as "Max's Cicada Book". It hefts nicely in the hand, it has an elegant black dustjacket ornamented with a superb Densey Clyne photograph, it has 19 colour plates of Jim Frazier's incomparable shots of pinned specimens for identification, and it is beautifully designed by the publishers, New South Wales University Press, including attractive endpaper and title page mosaics based on S.P.Kim's *Tettigarcta* illustration. But best off all is its lucid, informative text which is a credit to Max Moulds, the Sydney kid who grew up with cicadas in his suburban garden and never lost his love and enthusiasm for them as he metamorphosed into perhaps Australia's best known and most widely travelled entomologist.



Australia has a large (more than 200 spp) and diverse cicada fauna which is almost entirely endemic to the continent (only 4 occur also elsewhere). After butterflies, and perhaps beetles, cicadas are the most popular group among collectors, undoubtedly because of their conspicuous summer presence, their attractive appearance and their established place in Australia's childhood mythology. But a great impediment to collectors has been the lack of a comprehensive reference book allowing them to identify their catches and to know if their geographic records were of interest. That impediment is now gone and I predict an upsurge in interest in Australian cicadas similar to that which occurred for Australian butterflies following the first edition of Common and Waterhouse's "Butterflies of Australia" in 1972.

"Australian Cicadas" will inevitably be compared with "Butterflies of Australia" and they are very similar in overall arrangement. As the author admits in his Preface the cicada book evolved during its long gestation from from a planned "Guide", which would have treated just the commoner species, to a much more comprehensive treatment, approaching a monograph of the whole Australian fauna. This made it a

much more difficult task for the author but has led to an immensely more valuable book as a result. Whereas the names of almost all Australian butterflies are reasonably stable taxonomically and are associable with species in nature of reliably known distribution this is not the case with cicadas. Many taxonomic problems still occur and many available names refer to unique specimens or otherwise uncertain natural entities. This meant that to give a comprehensive treatment of the cicadas it has been necessary to establish many new synonymies, new combinations and new lectotypes in the book. Normally I would consider this inappropriate in a semi-popular book but the author has been scrupulous in ensuring that the Code has been adhered to and in providing sufficient justification for the changes mades. These actions add significantly to the scientific value of the book, though a summary of taxonomic changes, such as would normally appear in an "Abstract", would have been useful. There will be a few taxonomic headaches for future revisers in the genus *Pauropsalta*, however, because the treatment of its species in "Australian Cicadas" is often at variance to that of Tony Ewart's review of Queensland *Pauropsalta* (Memoirs of the Queensland Museum 27(2):289-375) which slightly pre-dates the book. Future bibliographers might have fun considering how that volume of the Memoirs has a date of 13 November 1989 but bears the name of a Premier not elected until December 2! "Australian Cicadas" is dated January 1990.

The introducory chapters of "Australian Cicadas" give concise accounts of life histories, predators, parasites, pathogens, sound production, collection, preservation and classification of Australian cicadas. A few extra line drawings would have been nice but use of photographs is an acceptable alternative. Of special interest is the discussion of the common names of our cicadas and their historical origins. The author has tried hard to stabilize the common names and has introduced inventive new ones for many species, e.g. Dodd's Bunyip, Red Treeticker, Green Baron, etc.

The dust jacket promises that the book includes "all known facts" about Australian cicadas and the individual species accounts fulfil the promise. Much of the detailed information on distribution and natural history presented is drawn from the author's own extensive field work over many years and appears in print for the first time. But the author has also been scrupulous in attributing information sources to other collectors, and hundreds of people will find themselves mentioned. This says quite a bit about the author's ability to enthuse local collectors during his frequent peregrinations around Australia. Clear distribution maps are given for most species. The combination of maps, colour photographs and text descriptions should enable fairly easy identification of most species. Keys are not given but many comments are given on differences between closely related species. All species not treated in detail are methodically listed with type localities so that the book becomes a complete reference book. It closes with useful glossary, bibliography and index.

GEOFF MONTEITH
Queensland Museum

BOOK NOTICES

"*Worms to Wasps. An Illustrated Guide to Australia's Terrestrial Invertebrates*", by Mark Harvey and Alan Yen. 240 pp. 160 line drawings. Oxford University Press. Price $17.95.

The first question asked by people studying invertebrates is "What is it?". This book is an attempt to enable people to answer that question to the classificatory level of Order for Australian terrestrial invertebrates. This is done by a series of illustrated keys supplemented by detailed line drawings of one species from each of the 68 orders ,including insects of course. The illustrations are by Graham Milledge. The book is a joint effort from members of the Survey Department at the Museum of Victoria and is a valuable source-book for not only students, teachers and naturalists, but also professional ecologists.

"*The Fly in your Eye*" by Jim Heath, cartoons and drawings by Janet Baxter. 20 pp. Published by, and available by mail from, J. & E. Publishing, PO Box 7317, Cloisters Square, Perth WA 6000. Price $8.50 (includes postage).

This delightful booklet came about by teaming a gifted public communicator, Jim Heath, with an inventive graphic artist, Janet Baxter, and giving them access to 20 years of CSIRO's fly research. The result is a masterpiece of lucid explanation of "everything you ever wanted to know about flies" written in an engaging yet informative style digestible by the lay person but equally useful for the professional entomologist. It concentrates on bush flies and houseflies with a comprehensive explanation of the significance and progress of the campaign to introduce exotic dung beetles for fly control in Australia. If you ever need to explain to non- entomologists why and when bush flies are a problem in Australia, and how they differ from houseflies, then this is the booklet for you. You might even find yourself learning (and laughing). As an example of how complex research programmes may be explained to the public it will probably become a classic.

Ingenious fly-proof clothes from the old days.

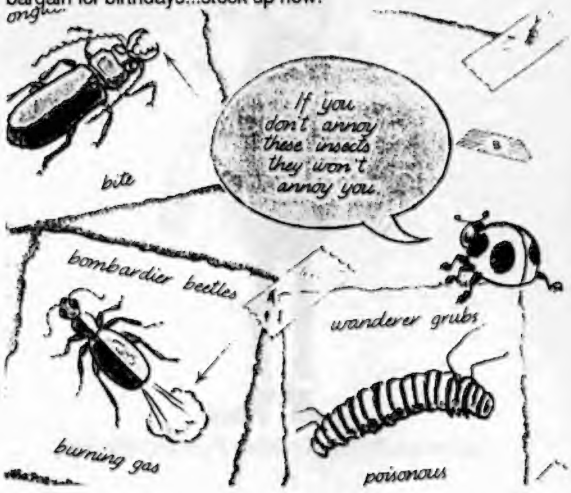
"*Brisbane, Butterflies and Beetles: the work of Amalie Dietrich, Millais Culpin and Alfred Jefferis Turner*" 150 pp. Brisbane History Group Sources, No. 4. Price $20.00 (plus $3.00 postage) from Brisbane History Group, 36 Ross Street, Wooloowin QLD 4030.

This soft-covered, illustrated volume is a feast for the entomological history buff. It is divided into three sections. The first deals with Amalie Dietrich, the redoubtable German lady who spent 9 years (1863-1872) collecting natural history specimens in Queensland for the Godeffroy Museum in Hamburg. This includes 25 pages of lists of insect specimens collected. The second section reproduces a remarkable flow of letters home to England written by a homesick 16-year old insect enthusiast who emigrated to Brisbane in 1891. The lad was Millais Culpin and the letters were to fellow members of his school Entomology Club in London. These lengthy and perceptive letters tell us much about his exploration of Brisbane's insects, not to mention the insight they give into the personalities of leading lights on the then Brisbane entomological scene such as W.H. Miskin, T.P. Lucas and H. Tryon. The third chapter is a short biography of the entomological career of Alfred Jefferies Turner (1861-1947). Turner was a leading medical practitioner of the time who, in his spare time, described about 3,600 valid moth species, some 38% of the known fauna of Australian moths. A complete list of Turner's publications is given.

Amazing Insects
Insects are among the most fascinating creatures on Earth.
Insects
Other animals (including people)
There are millions of insects — more than any other kind of animal.
Some insects are so tiny that a group of them could fit on top of a pin. Others are as big as mice or small birds.
Insects come in all shapes and colours. Some are so strange they look like tiny space monsters.
Insects live almost everywhere.
Cities
Mountains
Rainforests
Deserts
Lakes
Oceans

The Amazing Book of Insects —Activities for Children by Michelle Ryan and Robert Brunke (1990) 32 pp. Published by the Queensland Museum in association with the Queensland Education Department. Price $4.50 (plus $1.50 postage). Available directly, or by mail, from Queensland Museum Bookshop, P.O.Box 300, South Brisbane.Q.4101.

If you'd like to introduce insects to children in the 6-12 age bracket then this is the book for you. Produced as a joint effort by an Education Officer and an Artist at the Queensland Museum, it presents a wealth of information in an entertaining manner, concentrating on a "hands-on" approach. There are quizzes, board games, riddles and colour-ins, as well as construction details for insect kites, dioramas, mobiles and a "dragonfly magic movie". There are even recipes...."insect nectar" and "cockroach clusters"! Behind all the fun there is a strong information content and kids will learn what insects are, where they live, how they metamorphose, what they eat, how they are classified and where they fit into the environment. A bargain for birthdays...stock up now!



ACIAR'S FRUIT FLY WORK

One of the earlier entomological projects of ACIAR (the Australian Centre for International Agricultural Research) was a collaborative study of the fruit flies of economic importance in Malaysia, and how bait-spraying could be used under wet tropical conditions for their field control. Joint project leaders were Dick Drew (Queensland Department of Primary Industries), Allan Allwood (Northern Territory Department of Primary Industries and Fisheries), and S. Vijaysegaran (Malaysian Agricultural Research and Development Institute).

At the start of the study in 1984 it was believed that the major economic fruit fly of Malaysia was the Oriental fruit fly, *Bactocera* (formerly *Dacus*) *dorsalis*, but by the end of the project it appeared that this species does not occur in Malaysia at all. Extensive collecting in Peninsular Malaysia, and examination of material from other parts of Asia, has shown that "*dorsalis*" is a sizeable complex of species — and complex is an appropraite way to describe the situation.

Current thinking is that the true *B. dorsalis* is native to areas of Asia around the Tropic of Cancer and to the north (e.g. northern India, southern China, Taiwan), and is apparently replaced by sibling species further south. In Malaysia two undescribed species of the complex, provisionally referred to as Taxon A and Taxon B, are of economic importance, and further species occur but not in commercial fruits. Although the adults are hard to distinguish on conventional key characters, they have quite distinct host fruit preferences and distributions within Malaysia; they are also separable on fine detail of the ovipositor, pheromones and larval anatomy.

Besides the two representatives of the *dorsalis* complex, Malaysia also has *Bactrocera cucurbitae*, *B. latifrons*, *B. tau* and *B. umbrosa* attacking commercial fruits and/or vegetables. The project gathered comprehensive information on the distribution of each species within Peninsular Malaysia, its host fruit range (wild and cultivated), and its seasonal abundance. This body of information will provide a sound basis for pre- and post-harvest control measures, and also for formulation of any quarantine regulations necessary to govern movement of fresh produce.

The project also adapted the techniques of bait-spraying for use under Malaysian conditions, to replace the previous practice of frequent cover-spraying. A by-product from the Guinness brewery near Kuala Lumpur was found to be a suitable protein bait, and trials in starfruit (carambola) orchards produced spectacular results. Farmers noted at least 100% increase in fruit production, from better fruit fly control, from better fruit set because bees (previously killed by the cover sprays) were returning to the orchard and improving pollination, and from reduced numbers of a lepidopterous borer, apparently because there was less mortality of its natural enemies.

ACIAR is now planning a further project to build on these results. The Malaysian study will be completed by sampling in Sabah and Sarawak (East Malaysia), and a major new extension will involve Thailand - a country with about 60 different commercial fruits, ranging from temperate (apples, plums, peaches, etc.) in the far north to fully tropical in the south. From preliminary studies the fruit fly fauna of Thailand also seems to be diverse - no doubt "*dorsalis*" will be even more complex by the end of the project! The work will also include bait-spraying of various crops other than starfruit, to determine if production of these can likewise be increased by avoidance of cover-spraying.

PAUL FERRAR
Research Program Coordinator
(Crop Protection)ACIAR
GPO Box 1571
CANBERRA ACT 2601

Research Requests

COASTAL INVERTEBRATES OF NSW

Paul Adam (University of NSW) and Graham Quint of the National Trust (NSW) are currently working on a project for the Australian Heritage Commission to improve the database for coastal sites in New South Wales currently included on the Register of the National Estate, and to provide preliminary information on sites which may meet the criteria for inclusion on the Register.

The authors are interested in any sites which are felt to contain invertebrates of exceptional diversity, concentrations of rare or unusual species, etc. At this stage the aim is to provide indications of importance only. It is possible that in the future there will be studies to provide more detail. Could any information on appropriate sites or species be sent to:

Dr Paul Adam
School of Biological Science
University of NSW
PO Box No 1
KENSINGTON NSW 2033

IDENTIFICATION OF EUCALYPTUS CANOPY INSECTS

A program of sampling *Eucalyptus* canopy arthropods in Western Australia and New South Wales has recently been completed. Specimens have mostly been obtained from over- and under-storey trees by spraying the canopy with a pyrethrin insecticide.

All material has now been sorted and scored at the ordinal level. We now intend to sort and identify selected taxa to the species or morphospecies level. We are seeking expressions of interest from people who would be prepared to determine material from this hitherto relatively undersampled habitat.

Initially we will be sorting the Western Australian material. It is anticipated that the first batches of material should be available in the middle of this year. Any taxonomists who are interested in looking at material may contact me, stating the group which they are interested in. My address is: Dr Jonathan Majer, School of Biology, Curtin University of Technology, PO Box U1987, Perth, WA 6001. Tel. 09 351 7964, Fax 09 351 2495.

DIRECTORY OF LEPIDOPTERA CONSERVATION PROJECTS

The IUCN/Species Survival Commission's Lepidoptera Specialist Group is aware that there are many individuals and groups fostering the conservation of butterflies and moths, in many parts of the world. Many of these projects are being undertaken in relative isolation or on a very local scale, and are not widely known elsewhere. Many could perhaps benefit from increased opportunity to exchange information.

We plan to prepare a 'Directory' of Lepidoptera Conservation Projects, including both current projects and those which have been completed but for which results remain in private or unpublished reports. This will include projects such as distribution mapping, butterfly ranching, and surveys, as well as taxon-targeted, population-targeted and habitat-related conservation activities in many parts of the world. Both amateur and professional projects are welcome for inclusion and we hope to include a wide representation of current activities in these areas.

This flyer is being widely distributed, with the request that each recipient brings it to the notice of other relevant individuals and organisations. Would people please submit details of projects, as follows:

i) Title and objectives of project
ii) Specific activities
iii) Locality and duration
iv) Contact person, with address
(+ phone nos., FAX, if available)
v) Status: current, completed, planned, etc.
vi) (A few lines on the project)
vii Funding source and budget (if not confidential)
viii) A list of any reports or publications from the project

The information should be sent to:
Dr T.R. New,
Chairman, LSG
Department of Zoology
La Trobe University
BUNDOORA VIC 3083, Australia

before the end of August 1990. It is hoped to produce the Directory within a few months of that deadline, and all contributors will receive a gratis copy.

Conservation Committee

REPORT FOR OCTOBER-JANUARY

This last quarter has been taken up almost exclusively with preparing comments on the Endangered Species Draft Strategy document. Submissions had to be sent in by the end of December and our contribution to which Lionel Hill, Barbara York Main, Tim New, Alan Anderson and Eric Matthews contributed as well as myself is available on request. To summarise we considered the Strategy totally inadequate as far as invertebrates are concerned, it is directed predominately towards vertebrates perhaps not surprisingly as the Advisory Committee is dominated by vertebrate and vegetation experts. We recommended that someone with invertebrate expertise be employed under contract by the unit to provide an additional plan which addresses the needs of invertebrate conservation. A meeting was held in Sydney in early December to discuss the Strategy and I was fortunate in being able to attend this meeting. My report on the proceedings is printed here following.

Another task which has occupied us recently has been listing environmental projects with which members of the society are involved, for the Federation of Australian Scientific and Technological Societies (FASTS). FASTS requested examples of how "the work of our members is essential for the interest of the environment". In order to be in a position to "stress the role of science and technology in understanding the environment and managing it responsibly in the run up to the next election". Eric Matthews is coordinating the lists from each State and, apart from anything else, we feel it will be useful to the Committee and the Society itself to possess such a list. In the ACT for example, I circulated 92 members of the Society and received replies from 26 of which 24 were positive and who listed a total of 51 projects. This is of course, the minimum number of members in the ACT with environmentally important projects.

PENELOPE GREENSLADE
(Convener,
Conservation Committee)

THE NATIONAL CONFERENCE ON THE CONSERVATION OF THREATENED SPECIES AND THEIR HABITATS

"Towards a strategy for Australia's threatened species".
Taronga Park Zoo, December 1-4th 1989

Report by Penelope Greenslade, Convenor, Conservation Committee

Background

This meeting was organised by the Australian Committee for IUCN (ACIUCN) in collaboration with the Endangered Species Advisory Committee which is part of the Australian National Parks and Wildlife Service. The conference aims and format are described on the accompanying pamphlet.

In August 1989, I was asked by the organiser of the conference to provide a background paper on invertebrate conservation in Australia to be circulated to the participants, with others, before the meeting. As I was at that time writing a paper on the same topic with Tim New for a meeting on insect conservation in London run by the Royal Entomological Society of London, I offered this paper for circulation and added a few notes which were more closely related to the topics to be discussed at the three workshops at the Taronga Park meeting (both attached). Two weeks before the meeting, I received a dozen further papers on different aspects of conservation contributed by different workers in the field. These papers are now part of the Ent. Soc. Conservation Committee's library.

Programme and Speakers

The meeting consisted of three workshops: each workshop was briefly introduced by three or four speakers (see attached programme). Since over a hundred people attended the meeting, for the workshops we were divided into five groups of about 25 persons and an appropriate person was delegated to lead the discussions and report to the meeting after each workshop.

Attendance

Most of the people at the meeting were either employed by a State or Federal Conservation agency or were active members of a non government organisation (NGO). There were a number of people from zoos but only a small number of academics from Universities, Museums and CSIRO. Of those with expertise in invertebrates, there was Pierre Horzita,

(a crustacean expert from Tasmania), Evan Schmidt from La Trobe doing a PhD on Psocoptera and myself. In addition there were David Rounsevell from Tasmanian Parks, Wildlife and Heritage Department, Chris Watts from the South Australian Museum and Frances Michaelis from ANPWS who all have interests in vertebrates as well as invertebrates.

Proceedings

Harry Recher opened the meeting with an assessment of the present situation and the suggestion that we should participate in the political life of the country by standing for Parliament. He stressed that this was the best way of making real progress in conservation. He was followed by five speakers introducing the first workshop topic on "Threatened species management: current practices and new solutions ..." All five concentrated on mammals, not surprisingly as there has been hardly any management of endangered invertebrates in Australia. The first workshop discussion took the next 2 1/2 hours and reports were given the following morning. Discussion ranged over a large number of topics including the main cause of population decline, role of zoos and genetic banks, the need for knowledge of processes causing extinction, value of single species management versus umbrella species. There was general agreement that both improved communication to controlling bodies (such as local councils in particular) and ecological awareness education of the public were needed. New technologies such as germplasm banks and genetic engineering had a role to play. Improved management of Regional Parks, changes in legislation and setting priorities for allocating scarce funds were also mentioned.

This was followed by a short talk from the Hon Tim Moore, the New South Wales Minister for Environment. He described new initiatives in the State, especially those which encourage conservation attitudes in private land holders. It was also good to hear that planned changes in legislation will mean that invertebrates will now be included among the protected fauna in the Parks and Reserves of the State.

The second workshop dealt with the role of NGOs in the conservation of threatened species. Their contribution appears to be an important part of the Endangered Species Strategy and the Federal Minister is, I understand, supporting a closer relationship between voluntary and government conservation bodies. A "network" is proposed to link NGO's around the country. I am still confused: firstly as to how this will work; secondly, as to exactly what information will be transmitted via this network and thirdly, as to who will benefit. However those that advocate it and will be instrumental in setting it up, seem very confident on all these three points. In our workshop, we first defined NGOs and came to the conclusion that nearly every organisation of any size, as long as it is not directly part of the government, can fall into this category. Clearly specialist societies like our own are included but also Universities, Museums, Zoos and Botanic Gardens in some circumstances. The roles of NGOs, networking coordination and siting were other items discussed. Three hours were spent on this workshop topic.

The final workshop dealt with the Endangered Species Strategy document itself and here invertebrates had a much higher profile. The document was examined word by word and many modifications to wording and content made. Several changes were suggested by all workshop groups. These were that the Advisory Committee needed a broader base. For one thing it has no invertebrate expertise at all and it was suggested that specialist groups such as ours, be asked to advise it. Also the word 'endangered' should be replaced by 'threatened' or 'vulnerable' to reduce the bias towards vertebrates and the range of organisms to be included should be clearly defined. The phrase 'threatened habitats, ecosystems or ecological communities' should be inserted whenever threatened species was mentioned. This would make it much easier to include consideration of invertebrates and other less known higher taxa. Concern was expressed as to the guidelines and priorities by which the research grants were allocated. The specific mention of fox control in the document also was criticised by all workshops since elimination of foxes might not necessarily benefit marsupials as the feral cat population might increase, and it could even be deleterious where insect conservation is concerned if the rabbit population increases as a result. A need for accountability and to monitor and revise the Strategy after implementation was stressed. Since no targets or time scale (apart from that of the Atlas on Endangered Species), are mentioned in the document, this might be difficult to achieve. The publication of this Atlas by 1990 was considered unrealistic and was unanimously criticised by all workshop groups although it was thought that some kind of a data base, if properly designed and integrated with existing data bases, would be feasible. Other criticisms are either included in our own submission (attached), or are mentioned in the

resolutions from the conference (also attached).

Unfortunately the impression I, among others, retained of the conference was that the resolutions adopted had largely been decided before the meeting and that we had been, to some extent, manipulated into endorsing them. Needless to say the emphasis throughout was on vertebrates, however, I gather, that we did succeed in broadening the view of many participants and we were successful in airing recommendations to the Strategy that pertained to invertebrates. For my part the conference was valuable in that it enabled me to make contact with wildlife officers in all State Conservation Departments (except Queensland since the meeting included election day) and discuss insect conservation with them.

One major obstacle to insect conservation in several State Departments is the lack of a wildlife officer with any responsibility in this area. To redress this situation, we plan to encourage every State that has not so far done so, to submit invertebrate projects for funding for the next ESAC grants. The projects are being planned by us but the Departments will submit them and, if successful, appoint the staff and supervise them with the Conservation Committee in an advisory capacity. Hence a nucleus of staff within each Department will develop some expertise and interest in invertebrates. Preliminary discussions for several of these proposed projects were begun at this conference.

DIRECTORY OF AUSTRALASIAN ACAROLOGY

Last year Bruce Halliday, acarologist with CSIRO in Canberra, announced plans to compile a directory of workers interested in ticks and mites in the broader Australasian region. The Directory has now been issued as CSIRO Division of Entomology Report No. 46 and is presently available gratis from the Division.

The Directory lists the names, addresses and research interests of 126 people with acarological interests from Australia, New Zealand and Papua New Guinea. The major areas of current research activity are the biology and control of Tetranychidea, house dust mite allergy, and ectoparasitic mites and ticks of medical and veterinary importance. The Directory has useful cross-referenced Taxonomic and Subject Indices at the rear.

A Computer Database on Australian Butterflies

By K.L. Dunn, 1/7 James Street, Dandenong 3175 and
L.E. Dunn, 16 Grace Avenue, Dandenong 3175

Introduction

A computer database can assist collectors or research workers to readily obtain the information they need. Developments in data handling mean that facilities are now available to rapidly produce print-outs of species lists, collection dates, specified localities or regions. grid references, or simply verify movements of a past collector. Computer programs greatly reduce data search time compared with manual examination. A database can also help reduce the damage to specimens caused by repeated handling.

Distribution Records are Urgently required. Personnel involved in collection or observation of Australian butterflies are invited to send records to L.E. Dunn at the above address for incorporation into the database. All incoming records are edited and refereed by the authors. If the species is regarded as difficult to identify, or comes from an unusual locality, the contributor may be asked to verify the record. Contributors will receive a print-out of all records provided. A number of private collectors have already contributed their collection data.

Full label data is required where possible. This includes the species name, locality, date of collection, collector's name and whether the specimen was bred from juvenile stages. Records of common species are most valuable since these are generally poorly represented in collections. Observations on easily recognised species are also most welcome since it is not expected or necessary that every "admiral" or "painted lady" encountered be preserved. To assist in compiling records, format sheets will be sent on request for completion and return. Any field observations must be identified with certainty to ensure a high standard of accuracy. It is essential that any observation be indicated as such. These will be identified on file as observations since their identification cannot be substantiated in the future.

The Database

Our scheme was commenced in 1983 with the objective to compile, as a part time commitment, as many records of Australian butterflies as possible. Currently the data base

contains over 50,000 records and the number is steadily increasing by about 10,000 records per annum. These records are based on preserved material in the Australian National Insect Collection (Canberra), the Museum of Victoria (Melbourne), and a number of private collections.

Where information is adequate and judged to be reliable, data has also been extracted from published butterfly lists. This in many cases, involves records that are currently unavailable to us, and serves to keep the data base up to date regarding known species distributions. In groups where obvious taxonomic uncertainty exists data has not been compiled in order to minimise potential for erroneous records. For example, data from females of some *Ocybadistes* and *Telicota* species are not included. Although this kind of procedure omits many valuable records, it does combat potential for gross error.

The data entry and modification programs are written and compiled using FOXBASE+ (dBASE III+ compatible but considerably faster). The FOXBASE+ data is substantially compressed, and accessed in that format by the search program, which has been especially written in 8088 processor machine code.

The program package will run on any IBM or compatible computer system with a hard disk, 640k of memory, an EGA or VGA monitor, and utilising the "DOS" operating system.

Data Entry Format

The data base has been designed for the entry of typical insect label data which is generally in the format of a locality, state, date, collector and any rearing information if relevant. On entering the data into appropriate fields, the latitude and longitude references, the Australian meteorological district number, and the Barlow botanical region as defined by Barlow (1985, *Brunonia* 8: 387- 392) are added automatically from a map reference file. This file presently contains details of about 5500 locations regularly used as insect collection sites. Standard label formats are entered easily and are cross referenced where applicable to literature or detailed notes which may be attached to specimens.

Consider for example, a hypothetical specimen of *Delias aganippe* (Donovan) in the Australian National Insect Collection, Canberra (ANIC) with the following label data:

Canberra ACT
em. 26/12/88
I.M. Citizen
ex pupa

This particular label data would be represented as follows:
"420 CANBERRA 1 26DEC1988 IMC BRED ANIC W12"

420 — species code determined automatically for *Delias aganippe* (entry of the exclusive abbreviation of "agan" would be sufficient to establish and display the species name code)
1 — code for ACT
IMC — collector code based on initials (established by a similar process to the species name)
ANIC —repository or institution
W12 — cross reference to literature, altitude, or host details. (full details are entered in and can be accessed in another file)

The species and collector codes were chosen and established by us, and the State/Territory codes are the standard used throughout Australia. As indicated above, the user has the facility to determine the appropriate codes where these have already been established, simply by entering part or all of the species' or collector's name in the appropriate fields. As a result, hard copy listings of this information are not required during data entry. The data entry screen format makes provision for the rapid entry of repetitious data; such as when numerous species are observed and/or caught at a particular site on the same date.

Data being entered is initially stored in "temporary" data files which are appended to the main file at regular intervals. This avoids leaving the main data base vulnerable to power fluctuations, and at worse only a small amount of entry time can be lost or contaminated.

Data Search Facilities

In general, commercial database programs can rapidly find a particular record provided the data fields are correctly indexed to the search criteria. Such programs are however, very slow in locating single or multiple records matching a complex search selection criteria that is unrelated to the normal file indexing. In addition most programs are not satisfactory in the acceptance and manipulation of synonymous species names.

As a result, a specialised search program was developed and written in machine code by one of the authors (LED). It allows up to 40 selection criteria to be entered on an "and/or" basis in a user-friendly manner. The selections can include four selections of latitude/longitude criterion to define a particular area, or a single reference which is automatically expanded to define an area of thirty minutes square about the

selected reference point. The search program accesses various "look-up" tables to convert the compressed data to the normal format for display. Provision is made to print the screen output, and a data summary is also available.

On an IBM PS/2 Model 70, the total search time, regardless of the complexity of the search selection criteria, is a maximum of about 12 seconds.

Availability of Records and Future Publications

With the collated data, we intend to:

1. Present contributors with an attractive printout of their information.
2. Compile some regional lists of species, and a report on the distribution of species.
3. Prepare national maps of the distribution of individual species when sufficient information is compiled.
4. Make a complete updated distribution printout available to appropriate institutions when sufficient data is compiled.
5. Supply research workers with a search of the data for specific data to their precise requirements.

If information is supplied to other personnel or institutions, the collectors' name will not appear attached to their records (unless the contributor requests otherwise). This is to ensure privacy, and to protect contributors against future changes in conservation regulations.

Program Enhancements Being Undertaken

Currently work is being directed toward further improvements to editing, and facilities for modelling purposes such as graphs, charts and statistical figures. Suggestions or inquiries from readers regarding the system are welcome.

Although the program package is being developed for the specific use of the authors, we are willing to demonstrate the data entry and/or data search facilities to interested groups or institutions.

Acknowledgments

Thanks are extended to the curators of the ANIC and Museum of Victoria for allowing us to examine and document material in their care, and also to the private collectors who have contributed data from their own collections.

WA INSECT STUDY GROUP

At a meeting at Kings Park on 18 December 1989 convened by the WA Museum's Curator of Insects, Dr Terry Houston, and attended by 38 interested people, the following decisions were made with regard to the formation of an insect study group in Perth:

. An association for people with an interest in insects would be established in Perth. It would be open to amateur and professional entomologists but cater particularly for amateur interests.

- Its aim will be to promote the study of insects, especially those native to Western Australia, for personal enjoyment and the advancement of knowledge.
- It will be an independent body (but will collaborate with other natural history organisations including the Western Australian Museum, its prime sponsor).
- Its name will be the WA Insect Study Group (to be reviewed should incorporation be considered).
- Meetings will occur bimonthly on a Wednesday night.
- A steering committee comprising Terry Houston, Maureen Keady, Tony Oliver, Eric McCrum, Magnus Peterson and John Van Schagen will oversee the operations of the group until such time as a formally elected committee is set up.

The above steering committee met on 6 January 1990 and made the following further resolutions:

- General meetings will occur on the second Wednesday of each alternate month commencing on 14 February 1990
- First preference for a meeting venue will be the Kings Park lecture room and 2nd preference the Department of Agriculture Theatre, Como.
- Membership fees for 1990 will be set at the following rate: individual $5.00, family $5.00 for first person and $1.00 for each additional person.
- A bank account will be opened in the name of the group to receive membership funds.
- The life of the steering committee and the need for election of office bearers and incorporation will be raised as a topic for discussion following proceedings at the first general meeting on 14 February.
- A newsheet will be distributed bimonthly in advance of each general meeting to all financial members.

AUSTRALIAN ENTOMOLOGICAL SOCIETY

NOTICE OF THE 21ST ANNUAL GENERAL MEETING

The Society's 21st Annual General Meeting will be held at the Australian National University at 5.00 pm on Tuesday, July 3, 1990. The agenda will appear in the May issue of "Myrmecia".

Call for Nomination of Office Bearers and Councillors

The following offices will fall vacant at the Society's 21st Annual General Meeting on July 3, 1990. Nominations for election should be made on the form adjacent and should reach the Secretary no later than May 24, 1990.

Vacant Office		Present incumbent
President	++	Dr T.R. New
Vice President	+	Dr T.J. Ridsdill-Smith
Secretary	*	Mr J.D. Sandow
Treasuruer	*	Ms A.R. Hill
Public Officer	+	Dr I.D. Naumann
Chief Editor	*	Dr N.W. Heather
Business Manager	+	Dr J.F. Donaldson
News Bulletin Editor	+	Dr G.B. Monteith
Technical Editors	*	Dr B.K. Cantrell
	+	Dr P.G. Allsopp
	+	Dr D.J. Rogers
Regional Councillors		
QLD	+	Mr D.H. Foley
	+	Dr P.H. Twine
	+	Mr R.I. Storey
NSW	+	Dr D.G. James
	+	Dr D.J. Bickel
	+	Ms M. Geary
VIC	+	Mrs J.A. Horne
	+	Mr P. Vaughan
ACT	+	Dr P. Cranston
	+	Dr E.J. Wright
SA	++	Mrs A. Wells
	++	Dr D.A. Mackay
TAS	+	Mr L. Hill
WA	+	Mr P.R. Davis
NT	++	Mr E.S.C. Smith

\+ eligible for re-election to this office
++ not eligible for re-election to this office
* not standing for re-election

NOMINATION OF OFFICE BEARER

(This completed form should reach the Secretary by 24th May, 1990)

I Nominate: .....

for election to the office of: .....

Name of nominator: .....

Signature .....

Date: .....

I second this nomination: .....

Name of seconder: .....

Signature .....

Date: .....

I accept this nomation*

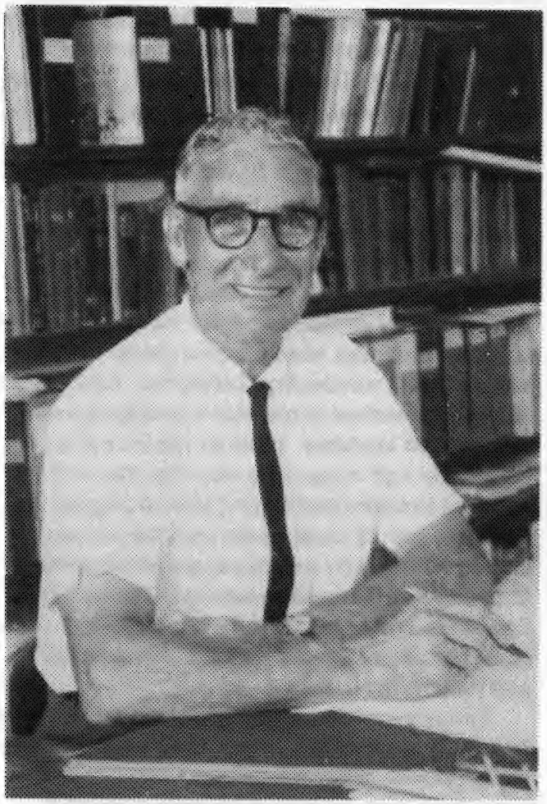
Signature .....

Date: .....

* This nominee is requested to attach a typed statement, not exceeding 300 words, which includes the following: his/her professional qualifications, address, institution, position held, fields of entomological interest, previous offices or appointments held in the Society; and other information which may be of assistance to members should a postal ballot be required.

(a photocopy of this form may be used)

Obituaries



Thomas Greaves (2nd August 1902–19th October 1989).

(Dr Doug Waterhouse and Mr Ray McInnes, both of CSIRO Entomology, combine their memories of Tom Greaves for this obituary).

Thomas Greaves was born in Coventry, England on 2nd August 1902. At the age of 9 he joined a small Nature Students Field Club in his home town and never thereafter lost his interest in insects and the outdoors. He was bright at school, winning a scholarship at the age of 11. However, his father died when he was 15 and he felt duty bound to leave school to earn money to help support his mother and her 6 other children. Amongst other jobs he worked as a Capstan operator for 3 years in Armstrong Siddeley Motors before deciding to seek his future in Australia. Eventually, in 1924, he applied to immigrate, armed with excellent references including one from his former head teacher:

"He is intelligent, perservering and enthusiastic, upright and honest in character, of good physique and blessed with good health. He is fond of the outdoor life — and appears to me as the right type of person for colonial life"!

He set out on the 18th October 1924 as a third class passenger on the Orient Liner "Ormuz" with a strictly limited weekly bill of fare, which included 7 gallons of water, 8lbs of bread or grains, 2lbs of potatoes, 3 1/4lbs of meat and a few ounces of other foodstuffs.

Through hard work he saved enough money in Melbourne in the next few years to place a deposit on a house, so that his mother and 3 youngest brothers could join him. In Melbourne his love of nature continued unabated and, in 1927, he became a Foundation member of the Entomological Society of Victoria, later being one of the 3 surviving charter members to attend its 50th Anniversary Dinner, which he addressed. He was an Assistant High Tension linesman with the Victorian Railways from 1927 to 1930, when he successfully applied for the position of Field Assistant in the 2-year-old CSIR Division of Economic Entomology in Canberra.

Tom often said in later years that one of the happiest days of his life was when he heard from the Chief of the Division, Dr Tillyard, that he had been appointed: indeed that he could scarcely believe his good luck that he was to be paid in the future to do a job which was his beloved hobby.

He took up his position in Canberra on 7th October 1930, at a salary of £5.3.6. per week, to work under the eminent termite specialist G.F. Hill. Very soon he gained the respect of his colleagues as being keen, hardworking and efficient, both in the field and the laboratory, so that, before long, he was promoted to the rank of Technical Officer. Tom combined his work with termites with a special and growing interest in ants and, in particular in the meat ant, which produces its characteristic large gravelly nests, not only in Canberra but also elsewhere in south-eastern Australia.

With the outbreak of World War II, Tom was involved briefly with grain storage insects before turning to the problems of protecting vegetables, particularly cabbages and potatoes, against insect damage. In 1944 he spent a period at Home Hill in northern Queensland carrying out tests with insecticides for use against cabbage pests. These constituted one of the first uses of DDT for agricultural purposes in Australia.

Shortly before the war the Argentine ant, a serious suburban pest wherever it occurs, had been discovered for the first time in Australia in Melbourne, but years of wartime neglect enabled it not only to establish a firm footing here, but to spread to Sydney and Perth. Tom firmly believed that it would be possible to undertake a successful eradication campaign and was eventually given the responsibility of mounting a joint State-Commonwealth offensive in NSW and WA. This involved testing and selecting insecticides, recruiting staff (at one stage up to 30 in Sydney), mapping the areas infested and then going into action. Where the measures were applied the infestations were certainly eliminated, but the wily argentine ant had the habit of establishing small colonies in new areas and these were seldom detected before they themselves had, in turn, spawned new infestations elsewhere, so eradication was not achieved.

Tom's interests next moved to studying the attack by termites on living trees highlighting the importance of the damage caused and developing methods for killing termite colonies without harming the trees. During this period he was successively promoted to Research Officer and then into the Senior Research Officer range, a truly notable achievement for someone who had no formal training. It was thoroughly deserved recognition for his many scientific contributions which included 32 entomological publications spanning almost 37 years with the Division. He retired in 1967 on the eve of his 65th birthday, but continued his entomological interests for a period and, indeed, subsequently published several papers on his beloved meat ants.

Already a foundation member of the Victorian Entomological Society, he became a foundation member of the NSW Entomological Society and also of the Australian Entomological Society, an achievement that few, if any, have matched.

In his early years in Canberra Tom became an active member of many societies or groups with outdoor interests. These included the Canberra Bush Walking Club, the 1st Rover Scout Crew and somewhat later he became secretary of the Canberra Boy Scout Movement.

Other major interests included music and singing. He was a foundation member of the Canberra Male Choir and of the Canberra Philharmonic Society. Later he became Concert Manager of the Canberra Orchestral Society and, in his early retirement, Secretary of the National Eisteddford Society.

One of his great interests was gardening and the very effective vegetable planting schedule he developed was widely distributed to newcomers to Canberra, increasing enormously our success in producing vegetables all year round. He contributed to the first edition, in 1948, of the 'Canberra Gardener'. In the latest (1982) edition, the 7th, he completely revised the section on vegetables and, for the first time, his invaluable Vegetable Planting Schedule appeared. Ever busy, earlier this month he was engaged on a revision for the forthcoming 8th edition. Tom frequently wrote articles on vegetable growing for the Canberra Horticultural Society, some of which appeared in the Friday Canberra Times column 'In the Garden'. For his many contributions to the Horticultural Society of Canberra he was made a Life Member.

It is not possible in, this brief account, to do justice to Tom's many other interests, but mention must be made of one of his special attributes, namely his great generosity to others, particularly those encountering troubled times. Especially in his own neighbourhood he continued to provide many with fresh eggs and vegetables. Indeed on 19th October he had just delivered a gift of eggs to the widow of a dear friend and was sitting on a piano stool laughing when he collapsed and died shortly after. Of course, no-one could have achieved all that Tom did without the help, support and encouragement of his beloved wife, Flora, a Queensland girl. She was living at Gorman House when he met her. He boarded at Acton Guest House when he first arrived in Canberra, although wisely he soon moved to Mrs Dunlop's guest house.

Tom certainly needed those attributes suited to a colonial life when he first arrived in Canberra, for the only official transport for the whole of the CSIR staff was a 1928 Chevrolet tourer, which had to cope with all field work as well as all administrative requirements. Personal bicycles had thus to be used for transport to experimental plots as far away as Braidwood and the Brindabellas. A bicycle allowance of 2 1/2d a mile was paid for the first 20 miles and 1d a mile thereafter. A tent was provided, together with 4s a day for food, all being loaded on the bicycle together with any necessary experimental gear.

Tom was always generous in sharing credit in his publications with those who collaborated with him. He was known to say that he looked forward each day as he set out to work, to the challenges he would face. He was an enthusiastic, hard-working achiever, loyal and generous.

His entomological publications will ensure that his contributions will be remembered long into the future. We mourn your passing, Tom, but are grateful at its nature.

Phillip Broughton Carne
(September 21, 1921–December 21, 1989)

Phillip Carne was born on September 21, in 1921, at Richmond, NSW. He spent his youth in Hobart and attended the Hutchins School in both primary and secondary grades. He joined a long list of distinguished products of the famous Hutchins School.

Phil then studied agricultural science at Melbourne University. In 1942, at the age of 21 and after the first two years study Phil joined the AIF and served for two years in the transport corps in Northern Australia. He resumed his studies in 1944. In 1946, he joined CSIRO's Division of Economic Entomology as an Assistant Research Officer, where he spent the balance of his working life, rising eventually to its highest grade, Chief Research Scientist.

I could say much about Phil's achievements as an entomologist and a CSIRO officer but let me pick just a little!

Phil's first research project was a detailed study of the pasture cockchafer, *Aphodius tasmaniae*, a native scarab beetle which damages pastures in south eastern Australia. This work on its biology, ecology and control culminated in a major publication in 1956 which became a benchmark for further studies on native pasture scarabs.

In 1951 he was awarded a CSIRO Studentship and spent two years in England gaining a PhD in Zoology at the University of London and the customary Diploma of the Imperial College of Science and Technology. He worked at the British Museum of Natural History where he undertook a taxonomic revision of a subfamily of scarab beetles (the Dynastinae) which includes many species of economic significance as pests of crops and pastures. On his return to Australia he studied the taxonomy of a sister group, the Rutelinae, and later the genus *Elephastomus* (Geotrupidae). These publications gained him recognition as an authority on these groups, recognition which he retained by publishing a series of short papers supplementary to his primary revisions. He was constantly called upon to make identifications for Departments of Agriculture, Forestry Commissions and the Universities.

Phil also achieved recognition as an ecologist, working on the ecology and population dynamics of insects which damage eucalypts in natural woodlands and plantations. These included the sawfly, *Perga affinis*, a chrysomelid beetle, *Paropsis atomaria* and various Christmas beetles. In collaboration with Ray McInnes, he published a novel paper describing the interactions between the yellow-tailed black cockatoos and cossid moth borers in the trunks of trees. Damage caused by the ravenous cockatoos can lead to many deaths of plantation-grown eucalypts. With Keith Taylor, he authored a chapter on insect pests in the CSIRO book "Eucalypts for Wood Production". These were just some of his research achievements. Phil showed, by his balance between systematics and field ecology, that the discipline of taxonomy is not some irrelevant academic pursuit. Rather, it underpins any serious endeavour to understand, manage and appreciate our rich and diverse environment, and is a cornerstone of economic entomology. His approach to science remains a model for our young scientists.

Phil played a leading role in the compilation of directories of wide entomological interest. These included 'Scientific and Common Names of Insects and Allied Forms Occurring in Australia'. He also compiled the second edition of the Directory of Australian Entomology'. The third edition, in which Phil was involved, should appear shortly.

Phil's appetite for work, and his reputation for fairness, brought him other responsibilities within CSIRO. He served with distinction on many committees dealing with entomological matters. His first essay in this area was as Secretary of the Pasture Cockchafers Committee in the late 1940s and early 1950s. This Committee met annually to review progress in research on pasture insects by both Commonwealth and State authorities. In this role he became recognised for his competence in the sometimes delicate task of coordinating the views of scientists with differing affiliations and prejudices, and producing lucid reports which were acceptable to all parties without sacrifice of accuracy. He went on to be a very active member of a Committee set up to organise the first International Congress of Entomology ever held in Australia; here, in Canberra, August 1972.

In 1973 he was appointed Secretary of the Standing Committee on Agriculture's Entomology Committee, a body comprised of the Chief Entomologists of State and Commonwealth Departments. He served in this demanding role continuously until 1981 (when SCA restructured its main Committees). Although the Statutes of Limitations might protect me, the laws of libel deter me from describing the antics of some of the State Entomologists that provided a supreme challenge for the patience and good judgement of Phil Carne.

In July 1975 the CSIRO Executive seconded Dr Carne for six months to be Officer-in-Charge of the new Division of Forest Research. Unlike any other CSIRO Division, the DFR was virtually formed 'overnight' by the transfer of the Forest Research Institute of the Department of Primary Industries to CSIRO. On Dr Carne fell the prime responsibility for instilling in a staff of some 200 Public Service employees the ethos and procedures of a CSIRO Division. He subsequently received glowing tributes for his achievements from the then-Chairman of CSIRO, Sir Robert Price, and from Dr Max Day who became the first Chief of the new Division. That Phil retained his sense of humour and a capacity to lead a normal life after that experience gives some measure of the man.

Within the Division of Entomology, Phil was called upon to carry out a wide variety of administrative tasks. He was Assistant Chief to Dr Doug Waterhouse between 1978-1981 and was re-appointed to the same responsible position when I succeeded Doug Waterhouse in 1981. Phil achieved a high reputation for approaching every new task with enthusiasm and efficiency, and for his reliability in observance of promised dates of completion.

One of his last responsibilities was Project Coordinator for the revision of a major text 'The Insects of Australia', first published by the Division in 1970. This task has involved coordination between 5 Editors, some 70 authors selected worldwide for their specialist knowledge, artists, illustrators and publishers. This major text, recognised as a principal reference around the world on matters entomological, will be available in July 1990. It will acknowledge Phil as 'editor-in-chief' and will be a lasting testimonial to his scholarship.

Phil has contributed more than any other of its members to the Australian Entomological Society. He was a Foundation Member of the Society (1965), and was responsible for drafting its Definitive Constitution and By-laws. He oversaw the Society's incorporation under the ACT Associations' Incorporation Ordinance in 1969. He acted as the Society's Public Officer continuously from that date. He combined this role with that of Secretary during a crucial phase in the Society's development (1969–1974), and resumed this dual responsibility in 1984. After his re-election, he had done much to enhance the Society's image, resulting in a marked increase in membership (now over 750). He has also, after seeking advice from professional archivists, reorganised the Society's records, with marked improvements in efficiency and economy of space. In 1987 Phil became an Honorary Life Member of the Australian Entomological Society.

In 1983 he accepted an invitation from the Bureau of Flora and Fauna to serve for 3 years as a member of its Editorial Committee for 'The Fauna of Australia'.

In recent years Phil has become actively involved in the formation in Australia of an Institute of Biology, independent of its British parent organisation. He was appointed to its Coordinating Committee in 1984, and elected as the Institute's ACT Representative in 1985. He was also involved in the formation of a Federation of Australian Scientific and Technological Societies, and contributed to liaison between these two bodies. In recognition of his contribution, Phil was made a Fellow of the Institute.

Phil was recognised as an expert on society constitutions in both the scientific and cultural areas. He drafted constitutions for three national societies — the Australian Entomological Society, the Ecological Society of Australia and the Australian Institute of Biology. There may even be others.

Of course, Phil had many interests outside work and entomology. He played a major role in Canberra's amateur cultural Societies, particularly in bringing into existence a

Council (the ACT Council of Cultural Societies) which speaks on behalf of its 70–80 member organisations, and the Griffin Centre, a now large complex which provides these societies with the facilities they need. The Griffin Centre offers member societies accommodation (ranging from large rooms for orchestral rehearsals and ballet practice to smaller sole-use rooms for libraries of books and sound recordings) and secretarial services. The Griffin Centre was formally opened by the Council's Patron, Her Excellency the Lady Casey, in August 1966, and is now well known as a major cultural centre and landmark. Dr Carne held office in the Council (and its parent body, the Cultural Clubs Working Committee) from 1960 until 1973. He served as its Publicity Officer, Vice-President and President. In 1978 he and Lady Frankel were elected co-Patrons of the Council.

I have spoken mainly of Phil's public life. Many of these achievements were accomplished between 8.00 am and 4.40 pm sharp, a feat made possible by his organised and disciplined approach to his responsibilities. Indeed that was the only thing I and many others were envious of Phil Carne. His day's work completed, Phil could retreat to his home life, his family, his garden, his music and his other hobbies. As with his work, the garden that Phil and Leigh developed has become the envy of many in Canberra.

Phil 'retired' on his 65th birthday in 1986. Free of the administrative hassels, he devoted his time to editing the Insects of Australia and assisting the various societies he remained associated with. If life was fair, Phil should have enjoyed many more decades of health and companionship with Leigh and his friends. But at least the time he had, was full of achievement and satisfaction. If Phil has been asked to sum up the day's play, I suspect he might have complained that bad light stopped play early. I am also sure he would have declared he had a damn good innings.

Finally, Phil will be remembered as the quiet achiever, who delivered on so many fronts. He did so in part because of his own personal qualities, but also because he was part of an effective team of two. The support and involvement of Leigh in many of the activities I have described was necessary to make it happen.

M.J. Whitten
CSIRO, Canberra
(Adapted from a funeral oration).

J.C. LE SOÜEF MEMORIAL AWARD 1989

The Entomological Society of Victoria bestows the annual J.C. ('Zoo') Le Soüef Memorial Award for excellence by an amateur entomologist. The 1989 Award has been made to GÜnther Theischinger of Engadine, NSW. GÜnther's energy, enthusiasm and productivity over a diverse range of insect orders are acknowledged by this Award. Since 1965 he has published around 120 papers on the systematics of Odonata, Plecoptera, Megaloptera and Diptera, and he is a recognised authority on these insects. He has written two chapters in the new *Insects of Australia* and he is currently concentrating on the taxonomy of Tipulidae, especially the vast genus *Molophilus*. He has recently visited the National Museum of Natural History, Washington, in connection with this work.

GÜnther's nomination also stressed his excellence as a field entomologist and his ability to stimulate and enthuse other people. His contributions to several difficult areas of Australian entomology, as an amateur, make him an outstanding recipient of this Award.

Gunther Theischinger, recipient of this year's LeSouef Award

Coming Events

21ST AGM AND CONFERENCE OF AUSTRALIAN ENTOMOLOGICAL SOCIETY

This big event takes place in Canberra, 30 June - 5 July, this year. The information brochure and registration form are enclosed with this copy of *Myrmecia*. Further information is presented inside the rear cover.

A welcome development is the confirmation that the launch of the new *Insects of Australia* will occur at a reception at Parliament House during the meeting. This book is an international triumph for Australian entomology and we are delighted that it will be launched at our silver jubilee meeting.

Most Canberra telephone and fax numbers will change from about 24 March 1990, however the general switchboard number for CSIRO in Canberra will remain as 06 246 4911. The CSIRO Division of Entomology FAX number will be 06 246 4000. Joanne Daly's direct line will be 06 246 4148.

XVII PACIFIC SCIENCE CONGRESS

Towards the Pacific Century: The Challenge of Change

Will be held in Honolulu, Hawaii on May 27–June 2 1991. Major symposia include: Global Environmental Change - Pacific Aspects; Population, Health and Social Change; Science and Culture; Biological Diversity; Emerging Technologies and Development; Frontiers of Physical Science: New Technological Advances and Pacific Science.

COLLOQIUM — BEHAVIOUR AND PHYSIOLOGY OF BEES

Organised jointly by the Royal Entomological Society of London and the International Bee Research Association this meeting will be held in London on 11-12 July, 1990 at the Queens Gate headquarters of RESL. Accommodation is being made available at Imperial College. Brochure available from RESL, 41 Queens Gate, London SW7 5HR, UK.

SYSTEMATICS AND BIOGEOGRAPHY OF THE AUSTRAL BIOTA

Ninth Meeting of the Willi Hennig Society Canberra, 24-27 August 1990

The first announcement for this meeting is now available. It provides a tentative list of speakers in the sessions which include: (1) Molecular biology and systematics. (2) The use of phylogenetic information in ecological and evolutionary studies. (3) Austral flora and fauna: systematics and evolution. (4) Austral biogeography. (5) Coevolution of plant and animal groups. (6) Phylogenetic computing software. (7) Poster session.

For more information write to Dr. Ebbe S. Nielsen, CSIRO Division of Entomology, GPO Box 1700, Canberra, ACT 2601, Australia.

5TH INTERNATIONAL CONGRESS OF ECOLOGY

To be held in Yokohama Japan, on August 23-30, 1990. Contact: Prof Yiuti Cho, c/- Prof Akira Miyawaki, Institute of Environmental Science and Technology, Yokohama National University, Yokohama 240, Japan.

AUSTRALIAN ENTOMOLOGICAL SOCIETY

STUDENT AWARD 1990

- This award is open to students who have not yet gained their PhD by June 30, 1990.
- Entrants need not be members of the Society.
- Submissions should be in the form of a scientific paper of 5000 words or less, on entomological research.
- Entries will be judged by a panel of senior entomologists appointed by the President of the Society.
- The winner will receive $250 cash and will be invited to present the winning paper at the AES Scientific Conference held in Canberra from June 30 to July 4, 1990. The Society will provide free conference registration, accomodation in Canberra and a return air fare from the winner's home State.
- Please indicate your intention to submit an entry by completing the form overleaf and returning it to the Secretary by March 2, 1990.
- Three copies of the paper, one and a half or double spaced, should be in the hands of the Secretary at the following address by the end of April, 1990.

Mr J.D. Sandow
Secretary, AES
ICI Crop Care
12 Dampier Road
WELSHPOOL WA 6106

Australian Entomological Society Inc.

STUDENT AWARD COMPETITION 1990

This is to advise that I intend to submit a paper on original entomological research for the Society's Student Award Competition in 1990.

My name is: .....

My postal address is: .....

.....

My paper will deal with (tentative title acceptable):

.....

.....

I am (or was) a student at (name of institution).

.....

My Supervisor's name is (or was):

.....

My current professional qualifications are:

.....

I will forward 3 copies of my entry to reach you by April 30, 1990 and acknowledge that no paper can be accepted for judging which is not received by that date.

Signed:.....

Date:.....

Return completed form to: Mr J.Sandow
Secretary, Aust.Ent.Soc.
c/-ICI Crop Care
12 Dampier Road
Welshpool W.A. 6106

CALL FOR NOMINATIONS FOR THE 1990 IAN MACKERRAS MEDAL FOR EXCELLENCE IN ENTOMOLOGY

The Executive invites nominations of Society members for the fourth award of the Ian Mackerras Medal in 1990.

Those wishing to nominate a member for award of the medal should bear in mind that:

(a) Only financial members of the Society who will be under the age of 50 years on 31 December 1989 are eligible for nomination.

(b) A candidate must be nominated by not fewer than two financial members of the Society.

(c) The proposers of a candidate shall provide the Society's Secretary, not later than March 16, 1990, with a detailed statement, including the candidate's name, date of birth, academic distinctions, relevant appointments and membership of Societies, together with a list of his or her more important publications. In addition, a statement should be made, in not more than 500 words, why the candidate merits this distinction in entomology.

(d) A Selection Panel for award of the medal will be appointed and convened by the President, and members of that panel shall themselves not be elegible for nomination, nor may they be signatories to a nomination.

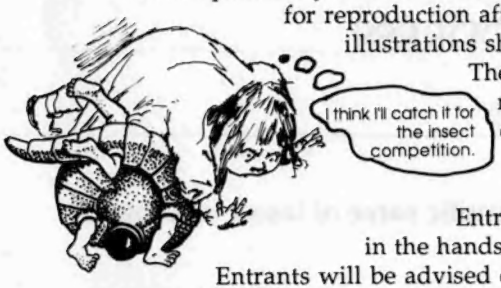
(e) Should the panel recommend to the Executive that an award be made, the name of the recipient will be announced at the 21st AGM in Canberra in June/July 1990 and, if possible, the medal will be presented to the recipient at that meeting.

Previous recipients of the Mackerras Medal are Dr J.A.L.Watson (1984), Dr R.W.Sutherst (1986) and Dr T.R.New (1988).

Biological Illustration Competition 1990

The Society invites entries to this competition in the form of taxonomic illustrations of insects. Anyone other than a person employed as a biological illustrator or entomologist may enter upto three (3) examples of their original work. Published illustrations will not be accepted.

Entries must be either a black and white or coloured whole body view of an insect (preferably identified) using any medium or technique, but suitable for reproduction after reduction by 50 per cent.The mounted illustrations should not exceed 21 x 30 cm (approx. A4). The winning black and white entries will be reproduced at the society's 21st AGM and conference in June/July 1990. The display will be open to the public.

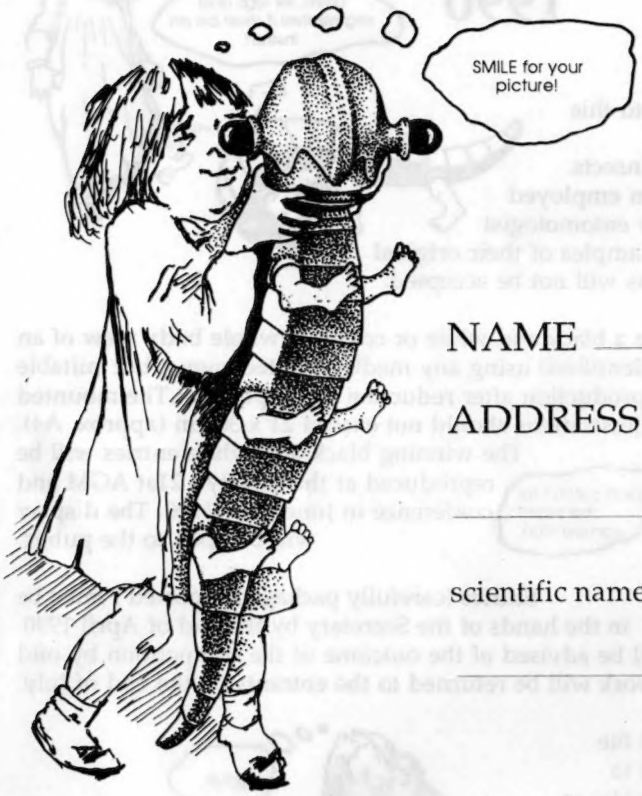


Entries (carefully packaged if posted) must be in the hands of the Secretary by the end of April 1990. Entrants will be advised of the outcome of the competition by mid June and original artwork will be returned to the entrants by the end of July.

A condition of entry is that the Society shall have the right to display selected works in public as outlined above and to reproduce the illustrations with appropriate acknowledgement on items such as greeting cards which it sells.

Prizes for both black/white and colour: 1st prize $300, 2nd prize $100

Entry Form



NAME _____

ADDRESS _____

_____

scientific name of insect (if known)

_____

Send this form with your entries to:
Mr J. D. Sandow
I.C.I.Crop Care
12 Dampier Road
Welshpool
W.A. 6106

21st AGM AND SCIENTIFIC CONFERENCE
CANBERRA 30 JUNE–5 JULY, 1990

SYMPOSIA

Insect/Plant Interactions
The invited speakers will address the areas of host plant resistance, induced defenses, secondary plant compounds, and coevolution. Contributed papers are invited in these and any other areas relating to insect/plant interactions.
Contact Roger Farrow, 062-465701.

The Role of Molecular Biology in Modern Entomology
The topics include insect transformation, vectors for change, strategic genes, insecticide resistance, molecular pathology, and species identification. Contact Joanne Daly and Marion Healy, 062-465349.

Evolutionary Ecology
Contributed papers are invited in the areas of life history tactics, optimal foraging, host and habitat selection, optimal behaviour sequences and decision making, sociality, sex ratio, sexual selection and mating. Contact Paul Wellings 062-465680.

SPECIAL WORKSHOP

Entomological Systematics in Australia: Future Directions
Invited speakers will review recent developments, summarize methods and applications and outline questions to be addressed during the workshop. Workshop groups, organised along systematic lines, will discuss future directions and priorities, and report to the plenum.
Contact Barry Richardson 062-741050, John Lawrence 062-465047 or Ebbe Nielsen 062-465493.

TRIBUTE TO AMATEUR ENTOMOLOGISTS
To acknowledge the importance of amateurs to the Society and to entomology in general, arrangements have been made for registrants to tour the Australian National Insect Collection and view some of the valuable collections donated by amateur entomologists.

CONTRIBUTED SESSIONS
Applied taxonomy, post harvest entomology, *Heliothis* biology, aquatic entomology, applied entomology and general entomology.

SPECIAL INTEREST GROUPS
Entomology education in the future, contact Robert Spooner-Hart 045-701229; Are rainforest insects diverse? contact Penny Greenslade 062-465063; Insect physiology, contact Peter Smith 062-465178.

SOCIAL EVENTS
An evening at the National Science and Technology Centre. A reception at Parliament House Annual Dinner Excursion to temperate rainforest.

REGIONAL COUNCILLORS

Queensland
Mr D.H.Foley
Entomology Department
University of Queensland
St Lucia Qld 4067
Ph (07)3773650

Dr P.H.Twine
DPI Entomology Branch
PO Box 102
Toowoomba Qld 4350
Ph (076)314292
Fax (076)347421

Mr R.I.Storey
DPI Entomology Branch
PO Box 1054
Mareeba Qld 4880
Ph (070)921555
Fax (070)923593

South Australia
Mrs A.Wells
Zoology Department
University of Adelaide
Adelaide SA 5000
Ph (08)2285691

Dr D.A.Mackay
School of Biol. Sciences
Flinders University
Bedford Park SA 5042
Ph (08)2752627 / 2572035

Australian Capital Territory
Dr P. Cranston
CSIRO Entomology
GPO Box 1700
Canberra ACT 2601
Ph (062)465290
Fax (062)470217

Dr E.J.Wright
CSIRO Entomology
GPO Box 1700
Canberra ACT 2601
Ph (062)465285
Fax (062)465539

Western Australia
Mr P.R.Davis
Agriculture Protection Board
Baron-Hay Court
South Perth WA 6151
Ph (09)3683232
Fax (09)3681205

Tasmania
Mr L.Hill
Agriculture Department
PO Box 303
Devonport Tas 7310
Ph (004)240238
Fax (004)242173

New South Wales
Dr D.G.James
Yanco Agricultural Inst.
NSW Agriculture
Yanco NSW 2703
Ph (069) 530244
Fax (069)530268

Ms M. Geary
Medical Entomology Unit
Westmead Hospital
Westmead NSW 2145
Ph (02)6337279/7548
Fax (02)6335314

Dr D.J.Bickel
Australian Museum
(Entomology)
PO Box A285
Sydney South NSW 2000
Ph (02)3398221
Fax (02)3604350

Victoria
Mrs J.A.Horne
Plant Research Inst.
Swan St
Burnley Vic.3121
Ph (03)8101511
Fax (03)8195653

Mr P.Vaughan
Survey Department
Museum of Victoria
71 Victoria Crescent
Abbotsford VIC 3067
Ph (03)4195200
Fax (03)4160475

Northern Territory
Mr E.S.C.Smith
Entomology Section
Dept. of Primary Industries & Fisheries
PO Box 79
Berrimah NT 0828
Ph (089)221256
Fax (089)470749

REPRESENTATIVE COUNCILLORS

Entomological Society of Queensland
Mr G.Daniels
Entomology Department
University of Queensand
St Lucia Qld 4067
Ph (07)3773656

Entomological Society of New South Wales
Mr J.A.Macdonald
Biol. and Chem. Research Inst.
PMB No 10
Rydalmere NSW 2116
Ph (02)6839777
Fax (02)6839714

Entomological Society of Victoria
Mr M.Hunting
49 Menzies Drive
Sunbury Vic 3429
Ph (03)7445178 (Home)
(03)7441900 (Work)

OVERSEAS CORRESPONDENT

New Zealand
Mr J.Tenquist
Wallaceville Animal Res. Centre
Private Bag
Upper Hutt. NZ

HONORARY MEMBERS

Dr I.F.B.Common
Dr J.W.Evans
Dr E.N.Marks
Dr K.R.Norris
Dr C.N.Smithers

MACKERRAS MEDALLISTS

1984 Dr J.A.L.Watson
1986 Dr R.W.Sutherst
1988 Dr T.R.New

SUSTAINING ASSOCIATES

Australian Entomological Supplies
Bayer Australia Ltd
Ciba-Geigy Ltd
Cyanamid Australia Pty Ltd
Dow Chemical (Aust) Ltd
ICI Australia Ltd
Shell Chemical (Aust) Pty Ltd

CONSERVATION COMMITTEE

Ms P.Greenslade (Convenor,ACT)
Ph (062) 465063
Dr T.New (Vic)
Ph (03) 4791111
Dr E.G.Matthews (SA)
Ph (08) 2238911
Dr B.Y.Main (WA)
Ph (09) 3803838
Dr A.N.Andersen (NT)
Ph (089) 470052
Dr D.P.A.Sands (QLD)
Ph (07) 37780711
Dr J.M.E.Anderson (NSW)
Ph (02) 3990344
Mr L. Hill (TAS)
Ph (004) 240238